JOURNAL

OF

THE FRANKLIN INSTITUTE

OF THE

State of Pennsylvania

AND

AMERICAN REPERTORY.

DECEMBER, 1844.

CIVIL ENGINEERING.

Report on the Atmospheric Railway. By JOHN LEONARD.

TO THE COMMITTEE OF MANAGEMENT OF THE CROMFORD AND HIGH PEAK RAILWAY.

Gentlemen,—Agreeably to the instructions which I received at the meeting, held on the 7th of March last, I proceeded shortly afterwards, accompanied by Mr. Brittlebank, to Dublin, to examine the atmospheric railway between Kingstown and Dalkey, and to ascertain whether, or not, the principle might be applied with advantage to our inclined planes. In our investigation we received every attention from the gentlemen connected with the undertaking, and were not only allowed to examine every part of it minutely, but were also furnished with every information derived from their own experience.

For the information of those gentlemen who may not be conversant with the principle of the invention, I will explain its peculiarities in contrast with those of other railways, as carried out, and in daily operation at Kingstown. On ordinary railways, the train, or load, is moved along by means of an engine attached thereto, and moving with it; on the contrary, on the atmospheric principle the load is moved by means of a *stationary* engine, at a considerable distance from, and totally unconnected with it; differing, however, not only from railways where the locomotive engine is used, but also from those on which the stationary engine is the propelling power; inasmuch as the rope is entirely dispensed with, and its place supplied by

the pressure of the atmosphere. This, therefore, forms the peculiar feature of the system, and constitutes the difference between it and all other modes of propulsion on railways.

The means by which the principle is put in practice, are simply these:—

Between the rails, and along the entire length of an ordinary single line of railway, a pipe is laid of, say, fifteen inches diameter. This is connected at one end by a steam engine, the power of which is applied to a large air pump, which, being set to work, pumps out, or exhausts, the air from the interior of the pipe. Within this pipe is a piston, or plug, which works freely along its entire length; but, nevertheless, so tight that but little air can pass from one side to the other. This being so far understood, it is clear, that by pumping out the air from the *front* side of the piston, the pressure of the atmosphere on the *back* of, or behind it, will force it forward with a velocity dependent, 1st, on the degree of rarifaction of the air in front of the piston; 2d, on the weight of the load to be drawn; and 3d, on the inclination of the railway. The great difficulty, however, and that which yet remains to be explained, is, how to communicate the power which is *inside* the pipe, to the load which is *outside*. To accomplish this, there is a longitudinal opening, or slot, on the upper side of the pipe, which is continued throughout its entire length. In this opening there is a bar of iron, which is attached *below* to the piston within the pipe; and *above* to the leading carriage of the train, or rather one used exclusively for that purpose, to which the train is attached, so that if the former moves along the latter must move with it. It is evident, however, that during the time the engine is at work, exhausting the air from the pipe, the opening, or slot, of that portion of it, which is between the engine and the piston, must be closed perfectly, or as nearly as possible, air-tight, otherwise a vacuum could not be formed. This is effected by means of a leather valve, hinged on one side of the opening, over which it falls, and extending its entire length, perfectly covers and closes the whole of it. This valve is covered with iron plates both on its upper and under sides, for the purpose of strengthening it, and is rendered more perfectly air-tight by means of a composition of wax and tallow, into which the outer edge falls when closed. A heater attached to the carriage completes the process by melting the composition as it runs along its surface, and effectually seals it in readiness for re-exhaustion.

There are other valves, but of a different description, which close *across* the pipe, and by means of which it is separated into divisions; one of these is placed at that end of the pipe which is opposite to the engine, so that when closed, the pumping can commence, and a vacuum be formed at any time, so as to be in constant readiness. When the train is about starting, and the air-pump has produced a sufficient vacuum, as indicated by the barometer, the traveling carriage, with the train attached, is moved by hand until the piston enters the open end of the pipe, within a short distance of which the *closed* separating valve is placed. This valve, immediately on the entrance of the piston, falls down, by means of a self-acting apparatus, and the pres-

sure of the atmosphere is instantly transferred from it to the piston, and motion forthwith commences.

During the passage of the train, the longitudinal leather valve has to be raised, or opened, to allow the bar before spoken of, as connecting the piston *within* the pipe to the train on the *outside*, to pass; this is done by means of a roller attached to the piston frame, within the pipe, which is placed a little in advance of the bar, but behind the piston, and which, as it passes along, raises the valve just sufficient to allow the bar to pass, which being done, the valve falls into its place again, and is immediately pressed down by another roller which follows for that purpose; the heater follows and seals the composition, and the whole is then ready for the next train.

The atmospheric railway, at Kingstown, is 1¾ miles in length, and, in that distance, rises, by variable gradients, 91 feet, which is equal to 1 in 115, or about 52 feet per mile. It has a main, or pipe, of 15 inches diameter, and is exhausted by an air-pump of 67 inches diameter, and 5½ feet stroke; worked by a steam engine of 100 horse power, making about 20 strokes, and discharging upwards of 5000 cubic feet of air per minute. The degree of exhaustion varies with the load; but for ordinary passenger trains it ranges on the barometer from 12 to 16 inches of mercury, which is equivalent to a pressure of from 6 to 8 pounds per square inch. The trains weigh from 15 to 20 tons, and the time occupied in working the engine for each is about 6 minutes; that is, 2½ minutes in exhausting the main, and 3½ in working the train up the 1¾ miles. Hence, the mean rate of traveling is about 30 miles an hour, but the greatest speed occurs about the middle of the journey, at which point the train moves at a rate of 40 miles an hour. The railway does not appear to be by any means adapted for high velocities, there being curves upon it which have a radius of not more than 500 feet; but this I believe was unavoidable, the railway having to follow the line of an old tram road, which had been used for the conveyance of stone from the quarries at Dalkey; as a mere experiment, however, it is valuable, inasmuch as it proves that curves of so short a radius may be traversed at a speed of from 30 to 40 miles an hour without danger.

Without entering into the subject of the atmospheric railway, beyond the legitimate object which we have in view, I may here remark that the application of the principle to a long, single line of railway, with an extensive, irregular, and miscellaneous traffic, would appear to me, in the present state of our knowledge of its capabilities, an experiment of doubtful success; confined, however, to such lines as would not require that trains should be traveling in opposite directions at the same time, and to situations where good locomotive gradients could not, at a reasonable expense, be obtained; the invention offers advantages which are not found in, nor could be accomplished so well, so safely, or so economically by any other with which we are at present acquainted. But, before making any further remarks on this part of the subject, I will proceed in considering it with reference to its application to our inclined planes.

In order to shorten and simplify the inquiry, I purposely omitted

entering upon anything which might be considered as common to both systems, and confined myself to those points only in which they might be expected to differ. Limiting my investigation, therefore, exclusively to the mode of applying the power, I directed my attention, first, to its mechanical practicability; secondly, to the comparative loss of power; thirdly, to the working expenses, wear and tear, &c.; fourthly, to the requisite permanent outlay; and lastly, to its comparative advantages and disadvantages.

As regards the first subject of inquiry, namely, its mechanical practicability, I found that the working parts of such as are most subject to wear, were, by no means, of a complicated character, nor such as would require either elaborate workmanship, or other than the most common materials in their construction; consequently, neither from their form, or material, are they such as, under ordinary circumstances, would easily be deranged, or soon worn out, or require other than common workmen and laborers for their repair, renewal, or management.

Exclusive of minute details, the only parts subject to wear are the piston, and the valve which covers the pipe; the latter being merely a strip of leather between iron plates, protected from the influence of the weather by the composition of wax and tallow, and merely raised a little out of its place once for each train, can scarcely be said to be subject to wear of any kind. The same may almost be said of the piston, which is simple and strong, and requires no further attention than the application of a little grease occasionally, and the renewal once a week, or so, of the leather packing, which can be done by an ordinary workman, or even an intelligent laborer. On the whole, therefore, there is nothing whatever in the system which would require a superior description of men to those which we now employ, nor any thing which they could not comprehend and manage as well as their present employment.

The second object of my inquiry, and one which I considered of great importance, was to ascertain the precise loss of power from leakage. I was the more anxious for satisfactory information on this head, because the substitution of a rope of air, for one of hemp, or iron, has been much dwelt upon, and the difference of their weight and friction considered as an addition to the net available power; but however plausible this may appear, it is possible that a loss of power may arise to as great an extent from pumping out the superfluous air from a pipe, as in moving a heavy chain, or rope; and if it should be found that the loss from leakage in the one case is equal to the loss from friction in the other, it would be evident that in this respect no advantage would be gained by one as compared with the other. The loss from leakage on the atmospheric system, (supposing the permanent joints to be perfectly tight,) can only arise, first, from the longitudinal valve; second, from the traveling piston; and third, from the air-pump piston.

The loss from the latter, whatever its amount, which, however, cannot be great, is permanent and irremediable. That arising from the traveling piston, is also, to a certain extent, permanent, but less in

proportion as the velocity increases, and the degree of exhaustion is diminished, while that from the longitudinal valve, which I consider the source of by far the greatest part, is proportioned to its length, and the degree of exhaustion of the main, diminishing, of course, as the piston approaches the engine; the loss, however, from this cause depends much on the attention paid to the state of the valve, and the sealing composition. On our inclined planes the loss of power which arises from the weight and friction of the chain, and other causes, amounts to about thirty per cent.; and, judging from information which I obtained at Kingstown, that arising from leakage on the atmospheric system, is as nearly the same as possible. The estimate of the loss is confirmed by some experiments made by Mr. Stephenson, the particulars of which were given me by the engineer of the railway, in one of which the loss from leakage was 33 per cent., and in the other 25 per cent. Hence, I was induced to conclude that the loss of power, whether caused by friction in the one case, or by leakage in the other, is as nearly as possible the same in both.

We are now come to the third subject of inquiry, namely, the working expenses, wear and tear, &c. On our inclined planes we have seven miles of chain in work, weighing 70 tons, which last, on an average, four years, and cost about £18 per ton; 70 tons at £18 per ton, amounts to £1260, which divided by 4 gives an annual expense for chains, of

	£	*s.*	*d.*
	315	0	0
We have also about 1500 pullies, or rollers, which weigh ¾ cwt. each, cost £10 per ton, and last about 7 years. Hence 1500 rollers at ¾ cwt. each, weigh 56 tons, which at £10 per ton, amounts to £560, and divided by 7, gives an annual expense of	80	0	0
Axles, wood bearings, &c.,	10	0	0
Sundries, such as large wheels, chain wheels, segments, preventers, tackling chains, shackles, coal, tools, damage, &c.,	100	0	0
Wages, estimated at	100	0	0
	£605	0	0

In ascertaining the working expenses of the atmospheric railway, I was assured by the gentleman who superintends it, that the amount was so trifling that it might almost be left entirely out of the calculation; indeed, from the remarks already made with regard to the wear and tear, it will be inferred that it cannot be large. The patentees allow in their estimate £50 annually per mile, for the renewal of the traveling apparatus. If, therefore, we take this sum and £25 additional for piston leathers, grease, and sundries, we shall probably have the annual cost sufficiently near for our purpose. £75 per annum, therefore, on 3½ miles, will amount to £262 10*s.*, which, exclusive of the interest on the permanent outlay, shows an annual saving on the atmospheric system of upwards of one half.

I have purposely left out of the calculation every thing relating to wages; because, not only the same description, but also the same number of men would be employed in one case as the other. Pro-

ceeding with our inquiry, our next object is to ascertain the amount of permanent outlay which would be required in changing from one system to the other. Our inclined planes are nine in number, and together are 3½ miles in length. Their inclinations vary from 1 in 6 to 1 in 16; hence, the atmospheric mains necessary to enable us to draw the same weights, as we now do, must, in one case, be 27 inches, and in the other 17 inches diameter. The air-pumps being proportionate to the power of the engines, would, for the greatest, be 44 inches, and, for the least, (leaving out the small engine at Whaley) 32 inches diameter. The estimates of the patentees show that a main of 15 inches diameter, laid down and ready for use, would cost £3350 per mile, and with the air-pump £3600. But much of the cost depends on the weight of material; and, as ours would require to be at least one-half heavier, in consequence of their increased size, we could not safely estimate the cost at less than £5000 per mile, which for 3½ miles would amount to £17,500. The interest on this sum at 5 per cent., would be £875 per annum, and added to the working expenses, wear and tear, &c., amounting to £262, would give the annual cost of the new system *to us* at £1137, instead of £600, as on the present plan.

It is clear, therefore, that whatever might ultimately be *gained*, nothing could be *saved* by the change; while for any *uncertain* advantage which might be expected to result from it, we should have a *certain* increased expenditure to the extent of, at least, £500 a year.

It now only remains that we should compare the advantages and disadvantages of the two systems; and, with this view we have to inquire in what other respect the introduction of the atmospheric principle would be beneficial.

The only object of importance which we should gain by the change would be *safety;* and although I am well aware of the value of perfect security in working inclined planes, I am nevertheless of opinion, that for a mere merchandize traffic, the outlay of eighteen, or twenty, thousand pounds is considerably more than the object is worth: besides, so far as relates to the safety of goods, we are now nearly as free from accidents, and damage arising therefrom, as we should be under any system.

If to this we add that under the atmospheric system we should be subject to inconveniences, which we do not now experience, it will tend further to show, that for a merchandize traffic, we are best as we are. The inconveniences alluded to would arise in this way: whenever a train of four, or more, wagons arrive at our inclined planes, they are, if loaded, drawn up in pairs, and as soon as one pair has reached the top, the other is immediately hung on at the bottom and drawn up without any further loss of time; but on the atmospheric system, the train would be obliged to wait until the engine had exhausted the main, unless it had been prepared in readiness; and, when the first wagon had been drawn up, the next would not only have to wait until the main had been re-exhausted, but also as much longer as would be required for the descent of the traveling

apparatus; making together, not less than six minutes delay between each pair of wagons, in addition to the time occupied in their ascent. The same kind of delay would occur to the descending wagons, with this additional disadvantage, that in order to raise the traveling apparatus between the descent of each pair of wagons, the engine must be kept in constant work; the same for downward as for upward traffic, causing thereby a considerable extra expense for coal and other requisites.

There are a few other inconveniences which would result from the change; but those which I have already pointed out, being of the greatest importance, and also quite sufficient to show that the application of the principle to our inclined planes, is, by no means, desirable. it is needless now to mention them.

From the preceding remarks it will, I think, appear evident, that the application of the atmospheric principle to our railway in its present state, so far from being any advantage, would, in fact, subject us not only to serious inconvenience, but to considerable additional expense. and that too, (so far as relates to our present traffic,) without any compensating benefit. It, however, by no means follows, that the principle cannot, under any circumstances, be applied with advantage; on the contrary, I am of opinion that it is peculiarly applicable to the circumstances of our railway, if properly carried out.

Railway Office, Cromford, July 1st, 1844.

Civ. Eng. and Arch. Journ.

A review of the circumstances which have affected the Consumption of Fuel in the Locomotive Engines of the Liverpool and Manchester Railway, from the opening to the present time. By Edward Woods, C. E.

This is an excellent practical paper, probably the very best with which Mr. Weale's quarterly budget has yet furnished us. The importance of the inquiry to which it is devoted, is sufficiently attested by the simple fact, that it has for its object to give the why and wherefore, of the consumption of fuel on the Liverpool and Manchester line, having been reduced (with an increase rather than reduction of traffic,) from 12,604 tons in 1838, to 3103 (!) in 1843. Mainly, this has been owing to a progressive increase from $\frac{1}{16}$th inch to 1 inch in the extent of the *lap*, (as it is technically called) or space by which the sliding valve overlaps at each end the steam ports (when placed exactly over them,) and to the greater rapidity with which the waste, or used, steam is thus enabled to escape from behind the piston. The *rationale* of this result is made exceedingly clear in the following extract:—

"Alternately to fill and empty the cylinder of its contents, are operations requiring *time*. The time allowed for the first operation, that of filling the cylinder with steam, necessarily corresponds with the duration of the stroke, whatever its duration may be. But this cannot be the case as regards the second operation, the emptying of

the cylinder. This ought to be performed in an instant, in the twinkling of an eye, in the minutest fraction of the duration of the stroke, otherwise the steam would continue pent up when it ought to be liberated,—when it ought to assume its minimum pressure, the pressure of the atmosphere,—and would exert an injurious counter pressure against the piston, tending to increase the resistance to be overcome.

"To effect the free and rapid discharge, it is necessary, not merely to open the communication to the exhausting pipe, but to open a *wide* passage, and to have this *done* by the time the piston recommences its motion. The valve alluded to (the old one used until 1838,) cannot accomplish this. Its motion is gradual, not instantaneous. The passage only begins to open when the piston is on the turn, and is not wide open until the piston has traveled through one-tenth of its entire stroke. The steam in the cylinder, is, consequently, restrained from escaping, being wiredrawn in the passage out, and, consequently, takes *considerable time* to assume the pressure of the atmosphere.

"In the meanwhile the new stroke has begun, and been partially completed, and so far the piston has had to contend with a resistance altogether illegitimate, a resistance which, in many cases, and especially at high speeds, has been equal to the sum of all the other resistances put together."

The merit of first getting rid of this illegitimate resistance is ascribed to Mr. Dewrance, of the Liverpool and Manchester line:—

"The next important improvement in the valves is due to Mr. Dewrance, and was suggested by him early in the year 1840. His principle was, that the exhausting passage, instead of being only partially open at the moment of completing the stroke, as was, more or less, the case with the engines before named, should be nearly wide open, which was to be accomplished by making the 'lap' of the valve equal to the width of the steam port;—moreover, that the travel of the valve should be made proportionate to the increased lap, so as to allow the same area, or the same amount of opening of the steam port for the admission of steam. A favorable opportunity occurred for carrying out these ideas, both as regarded increased lap and increased travel, from the circumstance of two engines requiring extensive repairs, which would allow time for the needful alterations. One inch lap was given to the *Rapid's* valve, which was now made to travel 4¼ inches. The result of this arrangement was, that the exhausting passage was one inch open at the end of the stroke, and that, supposing the stroke of the piston divided into 100 equal parts, the steam was cut off at 79; it expanded from 79 to 95; at 95 it began to be released, and was escaping into the atmosphere from 95 to 100. The *Rapid's gross* average consumption of coke, when running sixty-four trips of 30 miles each with coach trains, *before* the alteration, was 36.3 lbs. per mile, and 28.6 lbs. per mile immediately *after* the alteration. Thus we have a measure of the effect produced —*a saving of one-fourth of the fuel.*"

Mr. Wood gives the following valuable summary of the work

done, coke consumed, and loads carried, by the several classes of engines on this line for the last four years. It deserves, and, we doubt not, will receive the earnest attention of all other railway companies.

GROSS CONSUMPTION OF COKE.

					Coke. Tons.	cwt.	qrs.	Per mile
			Passenger Engines.					
½ year end'g	June,	1840	3463 Trips,	30 miles	1523	16	3	=32.9 lbs.
	December,	"	3596 "		1276	9	1	=26.5
	June,	1841	3493 "		1036	15	3	=22.1
	December,	"	3496 "		958	19	0	=20.5
	June,	1842	3655 "		853	3	3	=17.4
	December,	"	3526 "		684	9	2	=14.5
	June,	1843	3243 "		646	1	1	=14.9
	December,	"	3555 "		717	2	2	=15.1
			Luggage Engines.					
½ year end'g	June,	1840	1925 "		1160	12	3	=45.0 lbs.
	December,	"	1653 "		867	9	3	=39.2
	June,	1841	1640 "		749	0	1	=34.1
	December,	"	1370 "		531	17	1	=29.0
	June,	1842	1604 "		559	2	2	=26.0
	December,	"	1521 "		421	17	2	=20.7
	June,	1843	1588 "		441	7	2	=20.7
	December,	"	1605 "		451	12	2	=21.0
			Bank Engines.					
½ year end'g	June,	1840	349 Days.		486	11	3	
	December,	"	356¼ "		369	10	0	
	June,	1841	349½ "		343	3	2	
	December,	"	341¾ "		251	11	0	
	June,	1842	361 "		174	6	3	
	December,	"	363½ "		143	13	3	
	June,	1843	452¼ "		162	8	3	
	December,	"	517¾ "		183	12	2	
			Coal and Ballast Engines.					
½ year end'g	June,	1840	436¼ "		489	4	0	
	December,	"	370 "		344	17	3	
	June,	1841,	334 "		325	4	2	
	December,	"	351¾ "		312	4	2	
	June,	1842,	407 "		313	3	2	
	December,	"	443¾ "		243	3	3	
	June,	1843,	306½ "		226	5	0	
	December,	"	398¼ "		274	13	3	

Average loads, 7 coaches.

Average loads, 22 wagons.

Average load, 15 wagons.

General Result.

In the year 1838,	12604 tons of coke consumed.	
1839,	11754 "	"
1840,	6518 "	"
1841,	4508 "	"
1842,	3393 "	"
1843,	3103 "	"

Mechanics' Mag.

Mr. George Stephenson's account of himself.

This eminent engineer, at a recent entertainment at Newcastle, gave the following account of himself:—"The first locomotive that I made was at Killingworth colliery, and with Lord Ravensworth's money. Yes! Lord Ravensworth & Co., were the first parties that would intrust me with money to make a locomotive engine. That engine was made thirty-two years ago, and we called it 'My Lord.' I said to my friends that there was no limit to the speed of such an engine, provided the works could be made to stand. In this respect great perfection has been reached, and in consequence a very high velocity has been attained. In what has been done under my management, the merit is only in part my own: I have been most ably seconded and assisted by my son. In the earlier period of my career, and when he was a little boy, I saw how deficient I was in education, and made up my mind that he should not labor under the same defect, but that I would put him to a good school, and give him a liberal training. I was, however, a poor man, and how do you think I managed? I betook myself to mending my neighbors' clocks and watches at night, after my daily labor was done, and thus I procured the means of educating my son. He became my assistant and my companion. He got an appointment as under-reviewer, and at nights we worked together at our engineering. I got leave to go from Killingworth to lay down a railway at Hetton, and next to Darlington; and after that I went to Liverpool, to plan a line to Manchester. I there pledged myself to attain a speed of *ten miles an hour.* I said I had no doubt the locomotive might be made to go much faster, but we had better be moderate at the beginning. The directors said I was quite right; for if, when they went to Parliament, I talked of going at a greater rate than ten miles an hour, I would put a cross on the concern. It was not an easy task for me to keep the engine down to ten miles an hour, but it must be done, and I did my best. I had to place myself in that most unpleasant of all positions—the witness box of a parliamentary committee. I was not long in it, I assure you, before I began to wish for a hole to creep out at. I could not find words to satisfy either the committee, or myself. Some one inquired if I were a foreigner, and another hinted that I was mad; but I put up with every rebuff, and went on with my plans, determined not to be put down. Assistance gradually increased—improvements were made every day—and to-day a train, which started from London in the morning, has brought me in the afternoon to my native soil, and enabled me to take my place in this room, and see around me many faces which I have great pleasure in looking upon."

Lond. Athenæum.

Suspension Bridge over the Danube.

Mr. Tierney Clark, the engineer and constructor of Hammersmith

bridge, is about adding another laurel to his fame in this kind of architecture, by the completion of a most stupendous bridge across the Danube, the foundation of which was laid with much ceremony, by the Arch-Duke Charles, (as representative of the Emperor of Austria,) in August, 1842. The difficulties of constructing a bridge across this deep and rapid river have been long considered insurmountable; the lowest depth of water is always above twenty feet,—and in March, 1838, the river rose thirty-six feet above low water mark, breaking down the embankments placed to keep it within its limits, leveling houses, and destroying life to a great extent. The continual fluctuations of such a river, and the breaking up of the ice in winter, often forming immense masses a mile in length, and eleven feet high, will give some idea of what the engineer has had to contend with; he has, however, by the erection of the most stupendous coffer-dams and ice-breakers ever known, overcome every impediment—the gigantic work is fast approaching to completion—and its successful progress, by English talent and English workmen, in, to them, a rigorous climate, will prove another monument of the superiority of British scientific and mechanical skill, and a source of perplexing annoyance to our detractors. Some idea of the magnitude of one of the coffer-dams (that for the retaining pier on the Pesth shore,) may be formed from the fact, that five thousand persons were admitted within its area to view the ceremony of laying the first stone. The following are full particulars of dimensions, &c., of the bridge:—Distance between points of suspension 665 feet; two side openings each 297 feet; width of platform 42 feet—to be supported by cast-iron beams in one piece; height of platform above low water 50 feet. The suspension piers, or towers, are 150 feet in height from the foundations, of solid masonry, being faced with granite to the level of the roadway—the workmanship of the granite is of the finest description; the stone is brought from the granite quarries of Manthausen, in the neighborhood of Lintz, and distant from Pesth about 300 English miles—many of the stones weigh from ten to twelve tons. The coffer-dam for the second suspension tower, which has been the most difficult to accomplish, has just been completed, and when cleared there will be a clear depth of sixty feet; the piles which have been necessary to construct this dam were all in one length, from seventy-five to eighty feet long, and fifteen inches square—while of these piles nearly two thousand have been required, and some extraordinary fine specimens of oak measured one hundred and ten feet. This will afford some idea of the stupendousness of the undertaking. The oak came from the forests of Slavonia, in barges drawn by horses, and the fir timber from the forests of Bavaria and Upper Austria, down the Danube, a distance of some five hundred English miles. The total length of the bridge, with approaches, will be about six hundred yards—and will produce, from its peculiar situation in the centre of our capital, and amidst some of the finest buildings in Europe, a most imposing effect. This will be the first permanent bridge with stone piers built between Ratisbonne and the Black Sea, since the time of Trajan, A. D. 103, when a bridge was built across the Danube, at the Eixen Thor, or

Iron Gate, situated on the confines of Hungary and Servia, and where travelers perform quarantine before entering the Austrian dominions; the foundations of this bridge are still in existence, and are pointed out to the traveler, as well as the remains of a road hewn out of the solid rock, and which, constructed in part of timber, overhangs the river.

Lond. Min. Journ.

FRANKLIN INSTITUTE.

Fourteenth Exhibition of American Manufactures, held in the city of Philadelphia, from the 14th to the 30th of October, 1844, by the Franklin Institute of the State of Pennsylvania for the promotion of the Mechanic Arts.

The interesting ceremonial of distributing, '*to the most deserving*,' the awards made by the Committee on Exhibitions, was celebrated in the lecture room of the Museum, connected with the exhibition saloons, on the 24th of October, in the presence of a numerous audience, Thomas Fletcher, one of the Vice Presidents, presiding. Ellwood Morris, a member of the Committee, read the report, and, prior to this, John Wiegand, the chairman, delivered the following address:—

Address of John Wiegand,

Chairman of the Committee on Exhibitions.

Ladies and Gentlemen:—We meet you this afternoon to mingle again our congratulations over the achievements of American industry, taste, and skill. And here, on this occasion, we may meet, divested of every thing that partakes of party, or sectional, feelings, and, as citizens of this great republic, bear our grateful acknowledgments to the rapid and successful advance which the sciences and arts have made among us.

It is but little more than two centuries since the first colony of the pilgrim fathers sought a refuge and a home on the shores of America. They did not come to possess a land flowing with "milk and honey," in which the light of religion was shedding her benignant rays, and the arts and sciences, which bless and civilize man, were exerting their happy influence. They found this continent in all the original grandeur, yet sternness, of nature. It was exclusively the domain of the red man. Of the sciences and the arts he was utterly ignorant. To be successful in war and in the chase, was his highest ambition.

But how changed is the scene! The red man has passed away, and he lives now only in the tales of horror left us by the early settlers, or in the deep recesses of our western wilds. His hunting grounds are converted into fruitful fields, and where he made his council fires we have builded cities. The placid streams and lakes on which he launched his frail canoe are lashed into foam by the resistless steamship.

Our fathers who sought an asylum in the wilds of America, though blessed with unusual intelligence, were too fully occupied with clearing lands, and protecting themselves from savage beasts, and still more savage man, to find time to cultivate, to any extent, the useful arts. All that they could do was by the most rude contrivances to supply their most pressing wants. Necessity alone dictated the fashions of those days.

After a successful struggle to obtain a settlement, the mother country, as she was most strangely, but still fondly called, by various enactments prevented the growth of manufactures among the colonists. This was one among the many other grievances of which the colonists complained; and doubtless had its influence in accelerating the war of the revolution.

After the successful termination of our struggle for independence, and the adoption of the constitution, one of the first cares of the first Congress was for the manufacturing interests of the country.

And, notwithstanding the war of words, and the still worse war of feeling at the present day, the fathers of the constitution, and those who immediately succeeded them in carrying it into practical effect, looked for the perfection of our independence to the ability of the people to supply their own wants.

Our manufactures, however, did not keep pace with the other great interests of the country, commerce and agriculture; and the reason is obvious—Europe was in arms, her soldiery wanted bread, and we were found ready with supplies. Our merchants did a profitable carrying trade, and what of manufactures we needed we could pay liberally for.

It was not until the last war with England, that the country felt the importance of encouraging domestic manufactures. It was found at that period that we were literally destitute of the means of supplying our most necessary wants. It was, therefore, stern necessity which forced us into manufacturing.

Our first efforts were rude, and the fabrics which we then produced, and which were eagerly sought after, could not find, at this day, a market. The war with England was of short duration, and after its termination, and with the general peace of Europe, our country was inundated with foreign fabrics. They were sent here at prices so low as to involve in general ruin our own inexperienced manufacturers. The fact, however, was settled, that with proper encouragement, we had the industry and skill to supply our every want.

We date the establishment of manufactures as a great national interest within the last twenty years. By the wise and salutary measures adopted by Congress, manufactures were encouraged and protected; and they now form, and ever must form, one of the great leading interests in our national legislation.

Since this direct encouragement, extended by Congress, there is invested in capital the enormous sum of three hundred millions of dollars, for the production of all those articles that enter into the necessities, the comforts and elegancies of life.

All that can render man comfortable, and please the most fastidious

taste, can now be supplied by the skill of our own artizans, and at prices too which a few years since foreign manufacturers would have disdained to look at.

Many of the productions of our looms are now competing with European fabrics of the same description in foreign markets.

Our locomotives are to be found traversing the iron roads of Europe; and machines of pure American invention and construction, are astonishing the old world with their amazing powers; and entire establishments, with their proprietors, are transported to northern Europe, to construct machinery for Kings and Emperors.

But of our ability to manufacture—the specimens of skill, ingenuity, and taste, spread out before you in the present exhibition, in such rich variety and profusion, is one of the best and most convincing evidences that can be desired.

To form some just estimate of the extent of our manufactures, I have selected from the census of 1840, and from Professor Tucker's work on the "Progress of the United States in Population and Wealth," a few branches of the most important articles.

The value of Woolen goods is estimated, for the year 1840, to amount to	$20,697,699
Of Cotton goods to	46,350,453
Of Straw goods to	1,476,505
Of Wrought-Iron to	15,778,640
Of Cast-Iron to	7,172,275
Of Hardware Cutlery to	6,451,967
Of Machinery to	10,980,581
Of Hats and Caps to	8,704,342
Of Boots, Shoes, Saddlery, &c., to	33,134,403
Making the sum of	$150,746,465

To these should be added the various other products of the arts,—Glass, Cordage, Paper, Pottery, Books, &c., and the total of our manufactures will amount to two hundred and forty millions of dollars for the year 1840.

This sum, great as it is, will be doubtless greatly exceeded the present year, by the revival which has taken place in every branch of industry.

It may not be uninteresting here to say, that the New England and Middle States, containing less than two-fifths of the whole population of the union, produce more than three-fourths of all these manufactures.

The whole productive industry of our country, for the year 1840, was estimated as follows:—

Agriculture	$654,387,597
Manufactures,	239,836,22[illegible]
Commerce,	77,721,086
Mining,	42,358,76[illegible]
Forest,	16,835,060
Fisheries	11,996,008
	$1,043,134,73[illegible]

It would be interesting here to trace the beneficial effects of the manufacturing and mining upon the agricultural interests, did time permit.

These wonderful and gratifying results at which we have so hastily glanced, have not been obtained without the aid of science; in every successful effort we may trace her hand. For the high attainments we have made we owe much to the skill of our artizans, but we owe more to the labors of science; without her aid and light, the best efforts of our artizans would have been but uncertain groping in the dark.

We desire to leave this truth indelibly fixed in the minds of our artizans, that to be successful in their callings they must be intelligent. We do not ask them to become teachers of science, but we do ask them to become intelligibly acquainted with the various processes in their respective arts.

The means of obtaining this information are so abundant, and so cheap, that no man, and especially no young artizan in the city of Philadelphia, can have any excuse for being ignorant. We are not now begging favors, or patronage, for the Franklin Institute, but it is pertinent to our purpose to say, that in the Journal of the Institute, in her library, and her lecture rooms, may be obtained almost gratuitously, all the information which they need.

In contemplating the extent to which the manufacturing interest of this country must reach, and the amount of population to which it will give employment,—we are led naturally to inquire what will be the character of this population, and its influence upon the institutions of our country.

We hold the opinion that legislative action ought to fix the minimum age of children who may be placed at factory labor, and the maximum number of hours they may daily be employed. We think it would be well to prohibit, by severe penalties, the employment of any child who had not received the rudiments of an English education. Much as we appreciate the importance of our manufactures, we appreciate the education of the laboring classes still more. Indeed the permanence and prosperity of our manufactures, we believe to be intimately connected with intelligent labor. We never can consent to see our system of manufactures made the means of rearing up among us masses of ignorance, which must finally sink into poverty, crime, and helplessness.

We have the means of preventing these evils which we deprecate, for in all the manufacturing States abundant provision is made for the education of every child.

In looking at the extent of our country, its diversity of climate and soil—the boundless resources of our forests, the wealth of our mines, and our growing population— our national prospects are grand beyond all precedent; and they will be realized, too, if we are only true to ourselves and our institutions; if our youth—the hope of the nation—are trained up in intelligence, and in habits of industry; and if, above all, they are taught their obligations to God and their fellow men. Without virtue and intelligence, prosperity will destroy us.

Report of the Committee on Exhibitions.

The Committee on Exhibitions of the Franklin Institute, respectfully Report:—

That in the fourteenth exhibition now being held, they find cause to note, in the products of American art, a progressive improvement which reflects credit, both upon the mechanics and manufacturers, and on our common country.

In examining the multifarious objects of ornament and use which have been deposited for public view, the conclusion that American industry is amply capable of supplying all our country's wants, has forced itself upon the minds of this committee.

Specimens of most of the articles of prime necessity to the human race in civilized life, are now developed in these museum halls, and evidently display a superiority of finish in their various details, which, to the observant eye, marks the fact, that the experience of another year has produced its appropriate effect upon our artizans.

The present year is one of great prosperity, the workshops of the country are in full operation, and the committee find occasion to congratulate themselves, that though the number of articles exhibited may not be greater than on some former occasions, still both manufacturers and mechanics have spared the time necessary to send hither for exhibition, suitable specimens of their skill and industry.

That the public are neither backward, nor superficial, in their scrutiny, nor apathetic to the exertions of their industrious countrymen, is proven by the crowds which have constantly filled our halls, and the deep interest displayed by them in their examination of the various articles.

The propriety of holding, at intervals, these displays of American art and science, receives in the present exhibition, for the fourteenth time, so strong an evidence of public favor, as prompts this committee to renewed energy for the collection and display of articles of utility, and will unquestionably encourage our manufacturers and mechanics to augment their exertions in the creation and finish of such articles.

We are much pleased to see in the present exhibition several very creditable articles, the manufacture of which is but of recent origin here, but which nevertheless promise speedily to equal the make of any country.

The institution for which we are now acting, has for its leading object, the promotion of the mechanic arts, and to further its design, many of our worthiest citizens have devoted, and will continue to devote, large portions of their time and talents, without any other reward than the advantage which they, in common with all, derive from the cultivation of science and the arts within our country.

The present exhibition is governed by the usual regulations, which have been made as public as possible. This committee have closely adhered to them, and they now return their warmest thanks to the joint and several committees of arrangement, for the skill, taste, and judgment displayed by them in adorning the saloons, by an appropriate display of the articles under their control.

We will now proceed to detail, from the reports of the Judges, a summary of those articles exhibited, which appear the most worthy of minute notice, and to this we shall append the awards of premiums which have been made.

The committee most sensibly feel this to be a very delicate and yet quite important branch of the duties devolved upon them.

Aided by the judgment of competent and disinterested men, they have made their awards without fear, favor, or affection, and yet they are conscious that, in a grand array of several thousand articles, there may possibly be some which have been overlooked, though well deserving notices, or even premiums.

Relative to any such, however, we can only express the regret which every exhibition brings up to our minds, that the limited time for examination, and the immense number of articles to be examined, almost necessarily preclude our noticing, as we would wish, many truly meritorious objects, which both the judges and ourselves may have accidentally omitted to examine.

In conclusion we feel bound to add a remark upon a growing practice, which we find it impossible to view with approbation.

A number of our manufactures have attained such a degree of perfection, as to be equal, or superior, to the best of imported articles, and have enabled their makers to place upon them the foreign marks, and advantageously to enter them for sale in the general market, as the products of the industry of other countries.

This practice is, to a certain extent, fraudulent. It is certainly discreditable to this country, and it is with great regret that we think we perceive an increase of it during the present year.

I.—*Cotton Goods.*

As has been usual in our exhibitions, the display of cotton goods, and especially of printed cotton fabrics, is very fine.

When reporting last year upon cotton prints, we supposed the beautiful specimens then exhibited could scarcely be surpassed, but after a minute examination, we find that those of the present year have attained even a higher pitch of perfection, and fully justify the admiration bestowed upon them by the public.

Based upon the report of the judges of this department, we make the following awards:—

No. 35 and 36, cambric and furniture dimity, manufactured by Benjamin Marshall, Oneida county, New York, deposited by John W. Downing, well made and finished, so as to be scarcely inferior to imported fabrics of this kind. A Silver Medal.

No. 156, printed cotton and woolen balzorines, by Isaac P. Wendell & Co., of Philadelphia county, deposited by David S. Brown & Co.; for the printing of these upon foreign fabrics, in a beautiful and tasty manner, we award A Silver Medal.

No. 37, twilled Silesias, by Benjamin Marshall, Oneida county, New York, deposited by John W. Downing, of fine texture, but admitting of better finish. A Certificate of Honorable Mention.

No. 6, cotton duck for sails, made by Gambrill, Carrol & Co., Bal-

timore, deposited by James Maull, jr., a good, substantial article.

A Certificate of Honorable Mention.

No. 140, shoe thread, both bleached and colored, manufactured by Gould & Whetham, Manayunk, Pennsylvania, from American flax; possesses all the necessary requisites of shoe thread, and is an excellent article. A Certificate of Honorable Mention.

The judges also speak favorably of the sail twine and carpet chain of these manufacturers.

No. 153, Marseilles, for toilet covers, &c., made by R. Garsed & Brothers, of Philadelphia county, deposited by Tingley, Caldwell & English, not heretofore made in quantity, is a very creditable article, but might be improved in the finish with advantage.

A Certificate of Honorable Mention.

No. 199, fine cotton yarn, Nos. 40, 70, and 100, manufactured by the James' Steam Mill, at Newburyport, Mass., deposited by Charles W. Churchman; is beautifully even, and well made. The yarn No. 100, is believed to be the first of that fineness yet spun here in quantity, though small amounts have heretofore been made upon the Brandywine; we hail it as the precursor of the manufacture of fine fabrics of cotton, and award to it A Silver Medal.

The judges very justly speak, in the highest terms, of the beautiful array of cotton prints.

The specimens from Andrew Robeson & Sons, Fall River, Mass.; B. Cozzens, Providence, R. I.; I. P. Wendell & Co., Philadelphia; American Print Works, Fall River, Mass.; J. Dunnell & Co., Providence, R. I., and the Woonasquatucket Print Works, of Providence, R. I., are all rich, and glowing with brilliant colors, very tastefully arranged and blended.

The judges express diffidence in deciding between these elegant products of American art, but appear to think the prints of Andrew Robeson & Co., rather superior to the rest in accuracy of execution; they recommend, and we award, to *each* of these six concerns

Certificates of Honorable Mention.

Cotton prints from the Merrimack Company, Lowell, Mass., and from Joseph Ripka, of Manayunk, Penna., fully sustain the reputation of these well known manufacturers.

Printed lawn, by B. Cozzens, Providence, Rhode Island, was much admired.

Shirtings made by Marshall, New York Mills, and the James' Steam Mill, Newburyport, Mass., are excellent articles, particularly those from the latter factory.

Handsome specimens of mousseline de laine and balzorine prints, from J. Dunnell & Co., Providence, Rhode Island, deserve notice, but came too late for competition under our rules.

Some very creditable shirtings, casbans, and paper muslins, from the Lonsdale Manufacturing Company, Newburyport, Mass., arrived too late for competition.

There are exhibited shirtings, from the Merrimack, Hamilton, Phœnix, Waltham, Great Falls, Bartlett, Boot, and Carlisle Factories.

Sewing cotton, by Freeman Winn; printed cloak linings, boot laces

and braids, by Fletcher & Bros.; knitting cotton, by Haworth; ticking, by Robert Whitaker; cotton fringe, by Christian Linck; check, by C. McCuen; cotton flannel, counterpanes, suspenders, bath cords, cotton cords, nankeens, &c., all of them, especially the coarse cotton fabrics, are very good of their kind, but do not possess sufficient superiority over similar articles formerly exhibited, to require the bestowal of premiums.

In concluding their report, the judges seem to incline to the opinion that cotton goods of novel styles, known to be in our market, have been withheld from the present exhibition through "*inattention, indifference, or a desire of secrecy.*" If this is really so, we most sincerely regret it, on account of the manufacturers themselves, since experience has certainly most amply shown that the public display of meritorious articles is very decidedly advantageous to the makers of them. At a late period of the exhibition, some very beautifully finished, soft, even, and well printed mousseline de laines, were forwarded by the Woonasquatucket Print Works, Providence, R. Island, which are highly creditable specimens of a manufacture but recently introduced into this country.

II.—*Woolen Goods.*

We are glad to notice in this branch of our exhibition, a continuance of that progressive improvement which has gradually raised the woolen manufacture of America to a position of vast importance and utility. The judges notice in this department a large number of meritorious objects, and, comformably to their report, we make the following award of premiums:—

Nos. 60 and 61, five quarter cloakings, from Gilbert & Stevens, of Ware, Mass., deposited by Stone, Slade & Farnham, of admirable style and finish. A Silver Medal.

No. 70, embroidered woolen shawls, from Duncan & Cunningham, of Belleville, N. Jersey, deposited by David S. Brown & Co.; reflecting great credit on the maker, particularly in the embroidery. A Silver Medal.

Nos. 73, 74, 191, 192, and 193, nine pieces of six quarter plaid, or Highland cassimere, made by W. & D. D. Farnum, of Waterford, Massachusetts, deposited by David S. Brown & Co. Although similar in style to the three-quarter goods of the same make, yet, in consequence of their width and superior quality, we award them A Silver Medal.

Nos. 89 and 90, blankets, from the Gonic Manufacturing Company, Rochester, Mass., made of fine Pennsylvania wool, forming a very superior article of its class, and deposited by David S. Brown & Co. A Silver Medal.

Nos. 194, 195, 196, 197, and 198, superfine black cloths, made by W. & D. D. Farnum, of Waterford, Mass., and deposited by David S. Brown & Co.; these cloths receive a warm commendation from the judges, to which their superior make and finish very justly entitle them. A Silver Medal.

No. 81, black satinets, similar to the above, made by the Leeds Manufacturing Company, of Rockville, Conn., deposited by Dulles, Aertsen & Fisher. A Certificate of Honorable Mention.

Nos. 62 and 63, white flannels, from Gilbert & Stevens, of Ware, Mass., deposited by Stone, Slade & Farnham, are very excellent goods, and we award them A Certificate of Honorable Mention.

Nos. 71 and 72, embossed table covers, from Duncan & Cunningham, of Belleville, N. J., deposited by David S. Brown & Co.; these reflect much credit on the makers.

A Certificate of Honorable Mention.

No. 76, a good specimen of black cloth, from W. & D. D. Farnum, of Waterford, Mass., deposited by D. S. Drown & Co

A Certificate of Honorable Mention.

Nos. 77 and 78, plaid cassimeres, from W. & D. D. Farnum, Waterford, Mass., deposited by D. S. Brown & Co., are goods of excellent quality, and deserve A Certificate of Honorable Mention.

No. 80, black satinets, from W. B. Hotchkiss & Co., of Waterbury, Mass., deposited by Dulles, Aertsen & Fisher, made of fine wool, very skilfully wrought, and forming a meritorious fabric.

A Certificate of Honorable Mention.

No. 82, a lot of hosiery, from John Hopkins, of Philadelphia, deposited by the maker, contains some beautiful articles, and deserves

A Certificate of Honorable Mention.

Nos. 106 to 117, black and blue cloths, from the North Field Manufacturing Company, of Northfield, Vermont, deposited by David S. Brown & Co.; these are well finished, and substantial goods.

A Certificate of Honorable Mention.

Nos. 178 to 181, Saxony cloths, from S. Slater & Sons, of Newburyport, Mass., deposited by W. R. Hanson & Brother, are regarded as very excellent in quality, and deserving

A Certificate of Honorable Mention.

Nos. 182 to 185, black cloths, from the Hamilton Woolen Mills, of Southbridge, Mass., deposited by W. R. Hanson & Brother, appear to be substantial fabrics of good finish, and deserving

A Certificate of Honorable Mention.

Nos. 186 to 190, fancy plaid cassimeres, from W. & D. D. Farnum, of Waterford, Mass., deposited by D. S. Brown & Co., are deemed to be of superior make and finish.

A Certificate of Honorable Mention.

No. 203, ten pieces of figured cassimere, made by Edward Harris, of Woonsocket, R. Island, deposited by David S. Brown & Co.

A Certificate of Honorable Mention.

No. 21. a lot of exceedingly beautiful woolen and worsted yarn, made by Moses Hey, of Springfield, Delaware county, Penna., some of it spun remarkably fine, and all very even, and excellent in quality, we award A Certificate of Honorable Mention.

The judges have noticed in terms of approbation the following:—

No. 29, double milled black satinets, from the Bristol Manufacturing Company, Conn., deposited by Holmes & Hubbard.

No. 32, three quarter tweeds, from Edward Denny, Worcester, Mass., deposited by Brown, Earle & Erringer.

No. 64, a lot of wool in the fleece, from the prairies of Illinois, deposited by James Mott & Co.

No. 66, fleece wool, from West Alexandria, Penna., deposited by Houston & Robinson.

Fleece wool, from Columbia county, Penna., deposited by James Mott & Co.

No. 75, three quarter, and six quarter fancy cassimere, from W. & D. D. Farnum, Waterford, Mass., deposited by D. S. Brown & Co.

No. 138, two blankets, from Hutchcraft, of Paris, Kentucky, deposited by T. C. Rockhill & Co.

No. 204, an invoice of shawls, from James Nelson, of Philadelphia, deposited by the maker.

In concluding our notice of the woolen goods, we should not do full justice to the manufacturers of the fabrics exhibited, if we omitted to express the high satisfaction with which we examined many of the specimens of this important branch of art, which we conceive to be at this time making rapid progress towards a point of perfection that will equal, or surpass, even the most sanguine expectations of those who have observed the peculiar difficulties under which it has labored onwards.

III.—*Carpets and Oil Cloths.*

This department, so fully and beautifully represented last year, is, we regret to say, a very meagre one on this occasion. There are several very creditable articles, but none display the superior merit we have been accustomed to hail in this branch of manufactures.

We allot the following premiums:—

No. 25, two ply ingrain carpets, from Andrew Alcorn, of Philadelphia, a very fair article, and particularly well woven.

A Certificate of Honorable Mention.

No. 149, a piece of list carpeting, from John Lancaster, of Philadelphia. A Certificate of Honorable Mention.

No. 1, oil cloth, from C. M. Bailey & Co., Winthrop, Maine, deposited by J. M. Ellis, esteemed by the judges to be a very superior article. A Certificate of Honorable Mention.

No. 2, an oil cloth, from A. Johnson, Cincinnati, deposited by J. M. Ellis, appears to be a very good and serviceable article.

We are not aware of the cause of the deficient exhibition of carpets and oil cloths, but we hope it has arisen from the numerous engagements of the manufacturers of these articles. The oil cloths exhibited from Macaully's celebrated establishment, are very beautiful, and we award them A Certificate of Honorable Mention.

IV.—*Silk Goods.*

The fabrics of Silk, now exhibited, show that this manufacture is advancing with a firm and steady progress, which, in due time, will bring it into line with other similar branches of art, which have been longer established, and more generally attended to by our people.

The committee consider the productions of the current year to be such as afford ample encouragement for further exertions, and they make the following awards:—

No. 8, one case of silk goods, including one piece of plaid silk vel-

vet, from J. W. Gill, of Mount Pleasant, Jefferson county, Ohio; the first yet exhibited. A Silver Medal.

No. 41, ladies' silk clothing, a complete suit, including a bonnet, from silk grown in Pennsylvania, and manufactured by Mrs. McLanahan, of Philadelphia, who reeled every thread at her filature.

A Certificate of Honorable Mention.

No. 70, silk embroidered shawls, from Duncan & Cunningham, of Belleville, N. J., deposited by David S. Brown & Co., for the silken embroidery, A Certificate of Honorable Mention.

No. 139, satin stocks, made of American silk, by Mrs. Kneeland, of Philadelphia. A Certificate of Honorable Mention.

No. 145, embossing on French ribbon, said to be the first attempt in this country, by C. S. Marshall, of Philadelphia.

A Certificate of Honorable Mention.

The judges speak very favorably of the following:—

No. 40, three pounds of assorted sewing silk, from the New England Silk Company, of Dedham, Mass., deposited by E. M. Davis.

No. 68, one case of sewing and floss silk, from W. H. Richards, jr.

No. 3508, stocks exhibited by C. A. Walborn, of Philadelphia.

No. 1014, stocks exhibited by H. V. Wright, of Philadelphia.

221, one box of colored galloons, from W. H. Richards, jr.

No. 223, two very beautiful silk shirts, from T. R. Fisher, of Philadelphia, deposited by Hall & Brothers, arrived too late for a premium to be awarded.

No. 1600, black kid gloves, deposited in this department by William Hawkins, of Philadelphia, and No. 1603, similar articles, by J. R. Ashford, of Philadelphia, are particularly referred to by the judges as being of very superior quality, and we award to each

A Certificate of Honorable Mention.

In conclusion, we may express the gratification we feel at the intelligence that the silk manufacture is rapidly extending itself in the western quarter of the United States, and drawing towards it a considerable amount of capital, and labor, promises to be sufficiently remunerative to justify a considerable extension of its field of action.

V.—*Iron and Steel.*

Through the activity of the firm of Morris & Jones, of Philadelphia, and other houses, in bringing forward for exhibition specimens of the Iron and Steel consigned to them, the display in this most important department is highly creditable to the great iron interest of the country: the judges have given their usual minute and careful attention to the various samples, and agreeably to their reported opinion, we take pleasure in making the following awards:—

No. 2705, a bar of edge railroad iron, of the U form, rolled by the Mount Savage Iron Works, near Frostburg, Md., and forwarded by Col. Young, the manager. This bar, 18½ feet long, weighs 40 pounds to the yard lineal; it is part of a lot of several hundred tons recently rolled there for a branch of the Baltimore and Ohio Railroad, leading to the works. This bar is amongst the first edge rail yet rolled in the United States, and it demonstrates, beyond the reach of cavil, that

edge railroad iron can be well manufactured in America. This bar is well proportioned, sound, and well finished; it is the first ever exhibited here of American make; we hail it with pleasure as the beginning of a new manufacture, and award to it

A Silver Medal.

No. 2639, hammered bar-iron, from Castle Fin Forge, deposited by Morris & Jones; the bars are exceedingly well hammered, and the iron is of superior quality. A Certificate of Honorable Mention.

No. 2640, hammered iron from Speedwell Forge, deposited by Morris & Jones; the same remarks apply as to No. 2639.

A Certificate of Honorable Mention.

No. 2668, rolled iron from Colemansville Works, deposited by Morris & Jones; this sample is of a very superior quality.

A Certificate of Honorable Mention.

The judges notice in terms of approbation No. 2638, hammered iron, from Spring Forge, deposited by Morris & Jones. Rolled and slit rods, from Colemansville Iron Works, and others from Howard Iron Works, deposited by the same, and all of good quality. No. 2554, rolled and slit rods, from the Juniata Iron Works, deposited by Isaac Miller. No. 2523, two large sheets of boiler iron, made by Rowland & Hunt, are very well rolled, and weigh 216 and 305 lbs. No. 2667, four very large sheets of boiler iron, by Forsyth & Sons, deposited, like the preceding, by Morris & Jones, measure 15 feet long by 26 inches wide, and weigh about 340 lbs.; they have a very good appearance. No. 2535, two very large sheets of boiler iron, 14 by 2½ feet, made by J. & J. Parke, and deposited by Orrick & Campbell. Also one sheet, 15 feet by 26 inches, by Steele, Work & Edge, deposited by the same. All these three sheets appear very good, and are fine specimens of rolling. No. 2639, blistered steel, by W. C. Shay, deposited by Morris & Jones, and made from American iron, is a good steel. No. 2535, blistered steel, made and deposited by John Robbins; it is a fair article. No. 2587, imitation of Russia sheet-iron, by A. Wood & Brother, maintains, and even improves, its already high reputation. No. 2601, several sheets of this iron tinned by H. W. Butterworth, are very handsomely tinned, but are not now quite equal to English tin plate, though they bid fair soon to rival it. We award to him A Certificate of Honorable Mention.

A quantity of gas tubes and fittings, by Morris, Tasker & Morris, maintain the reputation of these well known makers. Similar articles by S. & W. Griffiths, also appear very perfect.

VI.—*Umbrellas, &c.*

This manufacture displays its usual degree of neatness and utility. The judges recommend, and we award to

No. 2052, a lot of umbrella, parasol, and shade stretchers, manufactured by Messrs. Barnhurst & Son, of Philadelphia, all excellent articles, which, until very recently, have wholly been imported, and the entire lot evincing most excellent workmanship.

A Silver Medal.

No. 143, a lot of umbrellas, by W. A. Drown, Philadelphia. No. 200, umbrellas and parasols, by W. & W. H. Richardson, Philadel-

phia, are deservedly praised by the judges, being, in fact, very good articles of their class, and we award to each

A Certificate of Honorable Mention.

VII.—*Lamps and Gas Fixtures.*

As has been usual of late years, the display in articles of this branch is truly magnificent in the present exhibition. The high degree of skill already attained by our workmen in these fabrications of metal forbids the expectation of much further advance in point of beauty of execution, but the details of arrangement may be improved, the economy of construction further sought, and a slightly higher degree of finish produced. In these respects the judges have found cause to note a degree of progress justifying the following awards:—

No. 2071, &c., lot of gas pendants, chandeliers, candelabra, solar, and other table lamps, by Cornelius & Co., of Philadelphia, the finish of which, and especially the beautiful galvanotype silvering of the white work, is of superior excellence. A Silver Medal.

No. 570, gas chandelier, of very taseful design, by E. Whelan, of Philadelphia, but admitting of higher finish.

A Certificate of Honorable Mention.

No. 2116, a creditable display of very well made solar lamps, by E. S. Archer, of Philadelphia. A Certif. of Honorable Mention.

No. 1047, a large assortment of hand, and students' lard lamps, by J. W. Henry, of Philadelphia. A Certif. of Honorable Mention.

No. 2051, a neat chandelier, and two bracket lamps, for pine oil, by M. B. Dyott, of Philadelphia. A Certif. of Honorable Mention.

W. Munsig exhibits a very neat and well made gas chandelier, which attracted the attention, and received the admiration of the judges, but came too late for competition.

As having relation to this department, the committee will mention that the Bude and the Boccius gas lights, which they were enabled to employ by night in the upper saloon, through the liberality of the Trustees of the Philadelphia Gas Works, were very brilliant, and much admired. The Bude light, in particular, developed a very intense and beautiful light, which illuminated with striking distinctness every object within its sphere of action.

VIII.—*Hardware and Cutlery.*

The articles in this department are very numerous. Many of them possess unusual excellence and beauty, and the whole have been subjected by the judges to a minute examination, which has resulted in recommending the following awards, which are confirmed by the committee:—

No. 1004, a card of assorted files, made by Robert Murphy, of Philadelphia, nearly equal in quality to the imported "Stubb's" Lancashire files, and much cheaper. A Silver Medal.

No. 1020, one case of guns, rifles, and muskets, by John Krider, of Philadelphia, displaying great taste, elegant workmanship, ample strength, and deemed to be the best ever exhibited.

A Silver Medal.

No. 1023, one card and four packs of pins, made by Slocum, Tillson & Co., of Waterbury, Conn., deposited by F. V. Krug & Co.; this is comparatively a novel manufacture in this country, and these articles have the heads smooth, the shanks well proportioned, smooth, and elastic. A Silver Medal.

No. 1039, a lot of sad irons and hollow ware, made by Savery & Co., of Philadelphia, truly admirable specimens of the founder's art, and surpassing any before exhibited. A Silver Medal.

No. 1061, one case of tailor's shears and hair scissors, made by R. Heinesch, of Newark, N. J., and deposited by J. H. Harkness, of Philadelphia, considered to be very elegant specimens of this branch of art. A Silver Medal.

No. 1061, one case of locks, made by Augustus Prutzman, of Philadelphia, the safety lock in particular evincing the highest ingenuity. A Silver Medal.

No. 1070, one card of butt hinges, made by the New England Butt Hinge Company, of Providence, R. I., deposited by E. J. Feinour; an article of much importance, and exceedingly well made. A Silver Medal.

No. 1083, one case of fine table cutlery, made by J. Russell & Co., of Greenfield, Mass., deposited by Curtis & Hand, displaying great taste, good temper, and high finish. A Silver Medal.

No. 1091, a patent safety lock, made by Thomas P. Murphy, of Philadelphia, particularly designed for banks, and other strong holds, the workmanship being unexceptionable, and the whole contrivance very ingenious. A Silver Medal.

No. 1006, several patent coffee mills, by John Rittenhouse, of Germantown, Penna., very well and beautifully made. A Certificate of Honorable Mention.

No. 1007, a card of rasps and files, made by George Machen, of Philadelphia, well cut, and well proportioned. A Certificate of Honorable Mention.

No. 1009, four pieces of britannia ware, made by Joseph G. Morrow, of Philadelphia, an article of excellent make and color. A Certificate of Honorable Mention.

No. 1015, one of Jenk's patent carbines, (very creditably made by N. P. Ames, of Chicopee, Mass.,) loading at the breech in a peculiar manner. This arm has been very severely but very successfully tested in our army, by order of the Secretary of War, and bids fair to supercede other carbines. We award to it, for the manufacture, a Silver Medal, and, for the invention, the Committee on Science and the Arts has already awarded a premium.

No. 1028, two cards of door locks, latches, and door springs, by T. L. Littlefield, of Philadelphia, very creditable both in design and execution. A Certificate of Honorable Mention.

No. 1029, one lot of hay and manure forks, made by John F. Hopkins, West Cambridge, Mass., deposited by David O. Prouty; very well tempered and finished. A Certificate of Honorable Mention.

No. 1032, a case of butchers' knives, &c., made by Henry Huber,

jr., of Philadelphia, showing decided improvement, good proportion, and finish. A Certificate of Honorable Mention.

No. 1035, one case of awl blades, made by Thorp & Hall, of Philadelphia, a new article of American make, and of good quality. A Certificate of Honorable Mention.

No. 1037, a bench vice, made by C. C. Chapman, of Philadelphia, a well finished article, adapted to holding both parallel and wedged shaped pieces. A Certificate of Honorable Mention.

No. 1044, a case of Britannia ware, made by Hall, Boardman & Co., of Philadelphia, which are very creditable specimens of material and work. A Certificate of Honorable Mention.

No. 1077, a lot of carpenters' planes, made by John Colton, of Philadelphia, the neatest and best finished exhibited. A Certificate of Honorable Mention.

No. 1087, a card of pins, assorted, made by Mitchell & Wetherill, of New York, deposited by Curtis & Hand, very good specimens of manufacture. A Certificate of Honorable Mention.

No. 1090, a case of trunk locks, made by Goodwin & Carr, Tenysville, Conn., deposited by Thompson & Carr, a comparatively new article of manufacture here, and strong, neat, and well finished. A Certificate of Honorable Mention.

No. 1100, one stand of sample stair rods, made by Edward Jones, of Philadelphia, displaying good taste, and high finish. A Certificate of Honorable Mention.

No. 2562, a case of shuttles, made by E. D. Tripp, of Trenton, N. J., deposited by A. W. Tiffany, are well made, and unusually well finished. A Certificate of Honorable Mention.

The judges also notice minutely, and with many expressions of approbation, the following articles, viz:—

No. 1008, silver mounted hunting sword, made by Jacob Faser, of Philadelphia; No. 1012, three cast-iron planes, made by the Savage Manufacturing Company, Md.; No. 1014, samples of gravitating locks, by S. C. Bemis, Springfield, Mass.; No. 1017, one case of rules, by Bremner & Co., N. Y.; No. 1018, one case of sample wrenches, by Merrick, of Springfield, Mass.; No. 1021, scythes, by Mansfield & Holman, Smithfield, R. I.; No. 1022, a case of rules, by Herman Chapin, New Hartford, Conn.; No. 1024, planes, by E. W. Carpenter, of Lancaster, Penn.; No. 1027, three scythes, by Hale, Waters & Co., Millbury, Mass.; No. 1038, cotton and woolen cards, by Prentiss & Brother, of Philadelphia; No. 1040, lever suspender buckles, by James Bingham, of Philadelphia; No. 1062, shovels, spade, and saw, by A. Wood & Co., of Philadelphia; No. 1064, lock castings, made by Cyrus Mansfield, of Elizabethtown, N. J.; No. 1069, files, by Thomas Perrins, of Philadelphia; No. 1071, rivets of iron, assorted, made by Faris, Edes & Co., of Plymouth, Mass.; No. 1073, locks, by Lewis McKee & Co., Tenysville, Conn.; No. 1075, spring cutlery, made by Bradley & Beecher, Naugatuck, Conn., to which last we award A Certificate of Honorable Mention.

No. 1080, hooks and eyes, by S. J. North, New Britain, Conn.; No. 1084, wood screws, by the New England Company; No. 1086, plane

irons, made by William Field, of Pawtucket, R. I.; No. 1088, bolts, made by Mattison, Russell & Co., New Britain, Conn.; No. 1094, circular saws, by Hoe & Co., of New York; No. 1096, repeating rifle, by H. Gross, Tipton, Ohio; No. 2007, hooks and eyes, by S. J. North, of New Britain, Conn.; No. 2043, shovels and spades, by T.C. Wood, of Philadelphia; No. 2501, rakes of wood and iron, by Henry Porter, Northumberland county, Penn.; No. 2551, shovels, by J. Richards, jr., of Philadelphia; No. 2570, screens, riddles, &c., by J. & D. Sellers, of Philadelphia; No. 2619, scales, by G. R. Moore, of Philadelphia; No. 1101, a curriers' knife, by Stephen Parry, of Philadelphia, for which last we award A Certificate of Honorable Mention.

The judges further notice favorably:—

No. 1098, molasses gates and turn buttons, by G. Jordan, of Philadelphia; No. 1106, spring cutlery, (pocket and pen knives,) by Wm. Wild, of New York, to which we award a

A Certificate of Honorable Mention.

No. 2658, wire screens, by Thomas S. Speakman, of Philadelphia; and finally, No. 2560, samples of cast-iron butt hinges, by Morris, Tasker & Morris, but those in the bundles are manifestly inferior to the samples.

In conclusion, the committee feel free to say, that in no department of American manufacture have they noticed more decided improvement than in the Hardware and Cutlery.

IX.—*Saddlery, Harness, and Trunks.*

A number of very neat and creditable articles are exhibited in this department, but they do not appear to possess any very marked superiority over the products of preceding years.

We make here the following awards:—

No. 523, fly nets, knotted by a machine expressly invented for the purpose, by John McMullen, of Baltimore; these are very good articles, but are usually made by hand, and are now, we believe, for the first time, made by machinery, consequently, we award, for the ingenuity displayed, A Silver Medal.

No. 559, a set of harness, made by Hughson & Vale, of Baltimore, Md., deposited by Mahlon Warne, which is very superior, and does great credit to the workman. A Certificate of Honorable Mention.

To John Unruh, of Philadelphia, for No. 531, a leather trunk, highly spoken of by the judges. A Certificate of Honorable Mention.

The judges speak in high terms of approval of No. 512, fly nets, by Miller & Mentz, of Philadelphia, deposited by the maker; No. 558, a very neat and well made gentleman's saddle, by William Hawkins, jr., of Baltimore, Md.; No. 560, a set of coach harness, by William N. Lacy, of Philadelphia; No. 559, a riding saddle, by Hughson & Vale, of Baltimore, Md.; a leather trunk, by James E. Brown, of Philadelphia; No. 546, two leather trunks, made by A. L. Hickey, of Philadelphia; No. 562, two very neat carpet bags, by Wm. R. Scott, of Philadelphia; No. 565, a valise trunk, neatly made, by Charles W. Conrad, of Philadelphia; and No. 582, a trunk of very creditable design and workmanship, by Isaac Hammit, of Philadelphia, deposited by Wm. R. Scott.

X.—*Models and Machinery.*

This very important department of manufacturing industry, which lies, in fact, at the foundation of the rest, since its province is to form the tools with which they work, is not so well and fully represented as the committee thought they had reason to expect. Last year the mechanics assigned the depressed condition of the trade as a reason for not bringing forward to the public view more specimens of their skill; but surely at the present moment, when the machine shops of the country are overflowing with work, that reason can no longer prevail. That the mechanic arts are keeping pace with other industrial branches, is a fact, which, in their business relations, the committee are quite aware of, and this knowledge adds to the regret we feel that our able artizans have not sent forward more numerous specimens of their skill. Still, amongst the articles exhibited, there are certainly some very meritorious machines, and, as the importance of this department seems to require it, we have embodied and adopted the report of the judges in greater detail than has been customary with us heretofore.

No. 2503, shearing machine, by Parsons and Wilder, of Hoosick Falls, New York, deposited by Thomas B. Slater, a well made machine, but not as simple and accessible as some others for the same purpose.

Nos. 2505, 2512, 2522, 2537, 2595, models of steam engines, by various makers, in which the proper proportions of the details seem to have been wholly disregarded, and, therefore, they are not worthy of special notice.

No. 2507, a piece of flat rope, which appears to be very well made.

No. 2508, model of a hose carriage and house, by Thomas Mason, of Philadelphia, very neatly made indeed.

No. 2511, model of a machine for splitting hoops; the committee are not sufficiently familiar with the contrivances in use for the same purpose, to judge of its novelty, but it seems to be ingeniously contrived, and will probably answer a very good purpose.

No. 2513, washing machine, made by E. Lukens, of Baltimore, of very simple construction, and, report says, works well.

No. 2514, a milling machine, used in coining money, made by George Eckfelt, foreman of the United States Mint; this machine, planned by Mr. Peale, the chief coiner, is of the same elegant design as those already in the mint, and is deposited by the maker as a specimen of workmanship. The whole machine seems to be absolutely without a fault, and all the details are in the most admirable "keeping." The accuracy of the workmanship, and exceeding beauty of finish, cannot be surpassed. It merits the strongest terms of praise, and we take pleasure in awarding, for the beauty and accuracy of the workmanship in this and No. 2515, A Silver Medal.

No. 2515, assayers' rolls, by the same maker; the arrangement is good, and the workmanship of the same admirable character as that of the milling machine just mentioned.

No. 2516, a lathe, with spiral gearing; this is an excellent speci-

men of workmanship and finish, by Jonathan Tompkins, of the United States Mint—we award it A Certif. of Honorable Mention.

No. 2518, a beautiful finished working model, made by W. Lawrence, N. Y., complete in all the details, of a New York fire engine; this is one of the most beautiful models of the kind we have ever seen, and reflects much credit on the maker. It is deposited by the Humane Engine Company, and we award it A Silver Medal.

No. 2519, the Humane Hose Carriage, by John Agnew, of Philadelphia, displays great elegance and beauty of finish, combined with extreme lightness. It well deserves a premium, but Mr. Agnew being a member of the Board of Managers, cannot receive any.

No. 2531, platform scales, by Ellicott & Gibson, Philadelphia; neatly made and simple, but no novelty was observed.

No. 2534, hemp hose, made by Amasa Stone, of Philadelphia; this is an article that does not properly come in this department, but appears to be well and strongly made.

No. 2542, model of a telegraph; this has already been before the Committee on Science and the Arts, and, no doubt, has been properly noticed by that body.

No. 2548, fire proof chest; one of the same kind, by the same makers, Evans & Watson, of Philadelphia, was exhibited and noticed at the last exhibition. The only novelty which the makers have introduced in it is in the use of the tumbler, or slide, which is ingeniously contrived so as to cover the key-hole when the key is withdrawn, and which must be removed before the key can again be introduced. The committee think that this improved escutcheon adds to the security of the lock, and we award it

A Certificate of Honorable Mention.

No. 2549, platform scales, made by Fairbank; the specimens are similar to those formerly exhibited by the same maker. They are very neatly made and finished, and sustain their reputation fully.

No. 2550, model of a canal boat, by N. B. Jenner, of Philadelphia, intended, we believe, to illustrate a new method of propelling, invented by the maker. This contrivance has already been submitted to the Committee on Science and Art, and is not one to be recommended.

No. 2552, patent spring perch for carriages, made by E. I. Gilbert, of Bridgeport, Conn., and deposited by Samuel W. Jacobs, of Philadelphia; this contrivance is lighter and more graceful than the common perch, and facilitates the motion of the carriage upon the springs. This appears to be a meritorious method of construction, and deserves reference to the Committee on Science and the Arts; we award it

A Certificate of Honorable Mention.

No. 2553, a lot of agricultural implements, deposited by D. O. Prouty, of Philadelphia, all of which seem to be very well made. The judges were not familiar with these articles, and did not, therefore, notice them as fully as they would wish. The centre draught plough, made by D. Prouty & Co., of Boston, Mass., appears to have some advantages over others; we award to it

A Certificate of Honorable Mention.

The drill, too, appears to be well adapted for the purpose for which it was intended; in fine, all of these specimens seem to be well, neatly, and strongly made, and are, no doubt, efficient implements.

No. 2557, a shower bath, made by Bates, of Boston, deposited by A. McDonough, of Philadelphia, arranged with a sliding top, so that the reservoir can be drawn down to a convenient height to be filled. This arrangement would, no doubt, be very convenient in many cases; we award it A Certificate of Honorable Mention.

No. 2560, a lot of iron tubes and flues, for steam boilers, made by Morris, Tasker & Morris; they are all well made and good articles, such as the makers have previously exhibited; we award then A Certificate of Honorable Mention.

No. 2564, a fire engine, (Hibernia) made by John Agnew, of Philadelphia, in his usual neat, elegant, and efficient style, which is so familiar to this community, as not to require any lengthy notice from us.

No. 2567, shearing machine, by W. H. Howard & Son, of Philadelphia; this appears to be a machine of no ordinary merit. It is well and neatly made, and embodies some important improvements, by which the parts are made simple and easy of access, the adjustments more easily made, and the cloth more easily placed in the machine. By the substitution of a larger shearing roller, with an increased number of blades, it is thought that it will be the best machine of the kind in use. If the improvements which have been introduced are new and original with Mr. Howard, we think it would be proper for him to submit the machine to the Committee on Science and the Arts, for a more extended notice and examination. We take pleasure in awarding to the makers of this valuable machine A Silver Medal.

No. 2584, a machine for cutting beef, made by John Wilson, of Philadelphia, which looks as if it would answer the purpose well.

No. 2593, a pair of smith's bellows, of superior workmanship and materials, made by R. H. Eckstein, of Philadelphia. A Certificate of Honorable Mention.

No. 2496, a pair of slide rests, by J. H. Schrader, of Philadelphia; these are very well made, and have attached to them the maker's improvements for adjusting the rest with facility and accuracy for turning cones, or taper pieces. We take pleasure in awarding to the productions of this excellent mechanic A Certificate of Honorable Mention.

No. 3608, a universal chuck for lathes, made by George Lyle, of Philadelphia; this is the best contrivance for the purpose that we have seen; it is well made, and we award it A Certificate of Honorable Mention.

No. 2609, a patent revolving window shutter, or close blind, formed of wrought-iron plates, and made by Potts & Yocum, of Philadelphia; this is the first shutter of this description that we have seen, and we are scarcely competent to speak understandingly of its merits. Nevertheless, we have learned that it has been very advantageously used in the city of Boston, and is much approved by those who have em-

ployed it, as being both convenient and thief-proof. It has our approbation as a meritorious article. We would suggest to the makers to submit it to the Committee on Science and the Arts.

No. 2614, a power loom for bed ticks, made by James Brooks, of Frankford; a neatly made loom, not differing materially from those in use. There are, however, one or two improvements in some of the details, which induce us to award it A Silver Medal.

No. 2612, a lot of platform scales, by J. D. Dale, of Lansingburg, New York, apparently more complicated, and not so neatly made as some others in the exhibition.

No. 2568, bonnet pressing machine, by W. H. Howard & Son, Philadelphia; this very meritorious machine came too late for competition at the last exhibition, and the judges had to regret that they could not recommend the award of a premium. That difficulty does not now exist, and the present committee have pleasure in carrying out the views of their predecessors in office, by awarding it

A Silver Medal.

No. 2575, a neatly made model of the Fair Mount Engine, by Mason, not, however, superior, we think, to other specimens at former exhibitions, by the same hand.

No. 2576, two tobacco presses, by Charles Evans; these are very simple and powerful presses, extremely well adapted to the purpose to which they are applied. They were not made for the purpose of being exhibited, but were taken from the workshop just as they are made for sale. They have been fitted up with as little work as possible, without any attempt at finish; the working parts are fitted, but the strictest economy has been used throughout, and no work that was not absolutely necessary to make them serviceable has been put upon them; we award them A Certificate of Honorable Mention.

No. 2578, a patent swingle-tree, made by Mr. Kinsey, of Berks county, Penna., an ingenious contrivance, but not quite as simple as others in use.

No. 2618, a carriage brake and swingle-tree, made M. S. Woodward, Chester county, Penn.; the brake is so arranged that the thrust, or pressure, necessary to force the brakes against the periphery of the wheel, is made to react upon the axle instead of the carriage body. Any objectionable stress upon the springs which sustain the body, is by this arrangement wholly avoided. The detaching swingle-tree is simple, and, we think, will answer a good purpose. The ingenuity evinced in these two contrivances, we think, merits the award of

A Certificate of Honorable Mention.

No. 2626, a type making machine, made by L. Johnson, of Philadelphia, invented by D. Bruce, of New York; this is an exceedingly ingenious machine, by means of which one man will do the work of three, or more. By simply turning a crank, types are made in the most perfect manner, at the rate of from one hundred to one hundred and twenty per minute. This is probably the most interesting machine in the exhibition, and we think it well deserves the award of a medal. We hope that the inventor will also submit it to the Committee on Science and the Arts, in order that its merits may be more

fully examined, and made known; we award to Mr. Bruce, for the invention, A Silver Medal.

No. 2632, a printing press, by Cosfeldt, of Philadelphia; this is, in form, the same as the Washington press, and only differs from it in having one member of the toggle joint made longer, so as to give more pressure; it is, however, a good and serviceable machine.

No. 2708, a machine for printing calicoes, made by Marshall & Brock, of Philadelphia, deposited by Thomas Hunter, which is neat and substantial, and gives evidence of being efficient for its purpose. A Certificate of Honorable Mention.

The committee feel indebted to Messrs. Marshall & Brock, for the display of a series of cotton cloths, showing clearly the numerous steps in the process of preparing, dyeing, and printing on fabrics of cotton.

No. 2646, a dynamometer, invented by Samuel Batchelder, of Saco, Maine, made by Howe & Goddard, of Worcester, Mass., is a very ingenious instrument for measuring the power required to drive small machines, such as looms, cards, &c.; for its ingenuity and efficacy we award it A Certificate of Honorable Mention.

No. 2682, a paper cutter, by A. L. Knight, of Philadelphia; this machine is used as an adjunct to the modern machines, which make paper in endless pieces, and cuts those pieces as they come from the reel, into the proper commercial sizes. A Certificate of Honorable Mention.

No. 2693, the New Market Fire Engine, built by John Agnew, is like all the products of his shop, a most admirable specimen of finish and efficiency.

No. 2517, box machine cards, made by J. & L. Woodcock, of Leicester, Mass.; a very good and well made article.

No. 2510, jointless wire harness; we are not informed how this kind of harness answers in practice, and cannot speak of its merits. We would suggest its reference to the Committee on Science and the Arts.

No. 2561, a loom, made by H. H. Bottom & Co., Trenton, N. J., and deposited by A. W. Tiffany, of Philadelphia; a very well made and finished piece of work. A Certificate of Honorable Mention.

No. 2571, machine cards, very well made, by Sellers & Pennock, of Philadelphia.

No. 2577, a mitreing machine, by W. B. Saurman, of Philadelphia; this has a clamp for adjusting and holding a piece of wood to be mitred, or beveled. It has a quadrant and index attached, by means of which the piece can be cut at any desired angle. It is well devised for the purpose. A Certificate of Honorable Mention.

No. 2600, last turning machine, made by S. S. Chase, of Philadelphia; this appears to be a very well arranged and effective machine; by it lasts of many different sizes may be made from the same model last. The committee do not know that any novelty in the principle of the machine is claimed, they would, however, suggest to the maker that it be submitted to the Committee on Science and the Arts. We award it A Certificate of Honorable Mention.

To Thomas J. Wells, of New York, for No. 2629, a rotary dovetail and tenoning machine, being, in fact, a lathe for turning first a cylinder, and then converting the end of that cylinder into a dovetailed tenon of rectangular section with great accuracy and rapidity. We award A Silver Medal.

This very ingenious machine has been much employed in N. York, and other places, for cutting dovetailed tenons of square section upon the feet of banisters, &c.; it is neither complicated nor likely to get out of order readily, and for its ingenuity, efficiency, and simplicity, commands the admiration of this committee.

To Garrett B. Davis, of Philadelphia, for an improved chimney cowl, which was successfully applied, during the exhibition, to augment the draught of one of the flues; we award

A Certificate of Honorable Mention.

No. 2630, a paper ruling machine, by Charles H. Kerk, of Philadelphia; a very complete and perfect machine.

A Certificate of Honorable Mention.

Some very thin sheet lead, by Tatham & Brothers, is very beautifully made indeed.

Notwithstanding the unusual extent of space which we have devoted to noticing this important department, the committee nevertheless fear that, amongst the numerous objects attracting their attention, they may possibly have overlooked some articles of importance which really merited a minute observation.

We have now to present our acknowledgments to Matthias W. Baldwin, one of the managers of the Institute, for the small steam engine and boiler now employed to drive the working machinery in the lower saloon. This engine is executed in the usual neat style which marks the products of Baldwin & Whitney's factory, and combines that ingenious arrangement of slide and pump which is peculiar to engines of Mr. Baldwin's design, and has been the frequent subject of admiration amongst mechanics. Mr. Baldwin being a manager, cannot, under our regulations, receive any premium for this simple and meritorious machine.

XI.—*Stoves, Grates, &c.*

The display of these very useful articles has been unusually fine. We notice in several instances new and useful forms, and, on the whole, we think there is a decided improvement, both in workmanship and in the taste with which the articles generally have been designed. Agreeably to the recommendations of the judges, we make the following awards:—

No. 2528, a range for cooking with anthracite coal, made by Julius Fink, of Philadelphia. A Certificate of Honorable Mention.

No. 2530, a similar range, in some respects, made by Lloyd & Feltwell, appears to act very well.

A Certificate of Honorable Mention.

No. 2506, a cooking stove, by Thomas Durell, of Philadelphia.

A Certificate of Honorable Mention.

No. 2592, a cooking stove, by J. Kisterbock, of Philadelphia.

A Certificate of Honorable Mention.

No. 2603, an assortment of very neat and useful stoves, by J. L. Mott & Co., of New York. A Certificate of Honorable Mention.

No. 2527, two cooking stoves, by Cluet & Billings, of Philadelphia, of Douglas' patent, of New York. A Certificate of Hon. Mention.

The judges notice, in a highly favorable manner, No. 2572, a large assortment of excellent stoves, by Fœring & Thudium, of Philadelphia; No. 2604, an octagonal radiator, of unique design, by Williams & Hinds; Nos. 2606 and 2563, two very neat stoves, by H. G. Bartles, of Philadelphia; a cooking stove, made by Marks, of Boston, and deposited by D. O. Prouty; No. 2548, a radiator stove, by Evans & Watson; and No. 2569, a cooking stove, made by F. H. Church, and deposited by Mr. Tuttle: also, the small anthracite coal cooking stove, made by Fœring & Thudium, at the instance of the Union Benevolent Society, and designed expressly for the use of the poor.

In conclusion, the committee express the pleasure with which they notice the complete success which now appears to attend the kitchen ranges and stoves for cooking with anthracite coal as fuel, and, in fact, a number of these contrivances seem to be almost perfect.—Though there appears to be a great variety in form amongst the cooking stoves, the committee are informed by the judges, "that they agree very closely in point of economy of fuel, and general convenience."

XII.—*Cabinet Ware.*

The specimens of Furniture, were, many of them, highly deserving for taste in the design, and elegance in the workmanship.

The beautiful examples of various articles of cabinet ware, made by the Messrs. Crout, of Philadelphia, from American woods, attracted great attention. They deserve our commendation, and having heretofore received a medal, we award them now

A Certificate of Honorable Mention.

We also make the following award:—

No. 2070, a therapeutic chair, designed for the use of the sick, very ingeniously contrived, and handsomely finished.

A Certificate of Honorable Mention.

The judges deservedly speak in strong terms of praise of No. 2011, fancy reed blinds, by Martin Free, of Philadelphia; No. 2012, wardrobe, dressing glass, and two centre tables, by John Barr & Co., of Philadelphia, are very elegant articles; No. 2027, one marble table, by H. G. Douglass, of Philadelphia; No. 2033, two pair of Venitian blinds, by B. J. Williams, of Philadelphia, are very neat and well made articles, worthy of the maker's reputation; No. 2060, one sofa table, and a pier table, by A. Miller & Co., of Philadelphia, are very fine articles; No. 2076, a wardrobe, of superior finish, by Moore & Campion; No. 2013, a dentist's chair, by William Foster, of Trenton, is a very excellent article, but came too late for competition.

The committee have observed with pleasure, and feel bound to notice with approbation, the cabinet work of No. 211, a very beautiful piano, made from American birch, by the Philadelphia company, which came too late for competition.

XIII.—*Musical Instruments.*

The number of Piano Fortes now exhibited is smaller than it has been for several years past, and the improvement which they indicate is not remarkable. Several of the instruments, however, are of excellent character, well made, and, in all respects, such as to confirm the opinions heretofore expressed in favor of the establishments from which they come. Those from Mr. Gale, of New York, and deposited by J. C. Smith, of Philadelphia, and Meyer, of Philadelphia, are of this class.

Agreeably to the opinions of the judges, the committee make the following award:—

No. 2028, an improved double action harp, made by J. F. Browne, of New York, and deposited by A. Fiot, of Philadelphia; in its plan, workmanship, tone, and appearance, worthy of very high praise.

A Silver Medal.

This beautiful harp, having upon it a foreign mark, the judges doubted whether it was really of American make, and to determine this important fact, they opened a correspondence with the maker, who forwarded sufficient sworn testimony to prove its having been made in New York, and marked in a foreign fashion, merely to meet a prejudice existing in the market in favor of foreign articles of this kind. With this positive evidence before us, relative to its origin, we join most cordially in the very warm commendations bestowed by the judges upon this truly elegant article.

XIV.—*Glass and China.*

The specimens of this beautiful and interesting department, though chiefly confined to Glass Ware in small quantities, have been very choice, and display decided improvement. The pressure of orders in the glass factories has prevented many of the manufacturers from sending hither any great number of articles for exhibition. Conformably to the opinions of the judges, we make the following awards:—

No. 1036, glass ware, made by M. & R. H. Sweeney, of Wheeling, Virginia, deposited by Joseph Bell, and comprising one very large and beautiful bowl, fruit bowls, celleries, pitchers, decanters, tumblers, and wine and jelly glasses, all of uniform quality, richly cut, and remarkably clear and brilliant. A Silver Medal.

No. 1051, by the Boston and Sandwich Glass Company, deposited by W. M. Muzzy, of Philadelphia, a lot of colored glass, far surpassing any before exhibited here, the colors being the most perfect and delicate we have yet seen, and the opaque glass being very skilfully made. A Silver Medal.

The manufacture of colored glass is of recent origin in this country, and it is highly gratifying to witness the degree of excellence already attained by the Boston and Sandwich Glass Company.

No. 2101, two painted porcelain cups, by M. Strasser, of Philadelphia; these paintings are creditable specimens of art, the colors being good, and the execution superior.

We award to M. Strasser, for No. 2101, a Certificate of Honorable Mention, and we cannot but express a regret that the manufacture of

porcelain, and its accompanying art, painting by fire colors, have not hitherto proved successful in this country.

XV.—*Books and Stationary.*

In this branch of art, though the specimens were not very numerous, some of them were strikingly beautiful, and we make the following awards to the most deserving, in our opinion:—

For the beautiful polychromic lithography, executed in the upper saloon, by Pinkerton, Wagner & M'Guigan, artists in this elegant branch of colored printing from stone, which was deservedly admired by all who witnessed it. *Five* different colors have been successfully employed by them in the same piece, and for the finished execution displayed in this recently introduced branch of art, we award them

A Silver Medal.

No. 24, a volume of "Les Jardins des Plants," bound by J. David, of Philadelphia; for the superior perfection of the series of lines executed in the binding, A Silver Medal.

No. 210, the set of "Indian Biography," in this lot, bound by Lippincott & Co., of Philadelphia, deposited by T. B. Wells; for the general execution of so large a volume, A Silver Medal.

No. 210, for the beautiful specimens of velvet binding, in this lot, by Lippincott & Co., of Philadelphia, deposited by them,

A Certificate of Honorable Mention.

No. 41, books, from Lindsay & Blakiston, of Philadelphia; a certificate of honorable mention has been recommended by the judges, but Mr. Lindsay, being a member of this committee, cannot receive it.

No. 144, a beautiful lot of hand made writing paper, made by Wilcox & Co., of Delaware county, Pennsylvania.

A Certificate of Honorable Mention.

No. 146, a lot of parchment, a very good article, by Preston Marshall, of Philadelphia. A Certificate of Honorable Mention.

The judges speak favorably of No. 84, a lot of books from the Sunday School Union; No. 150, the engraving and binding of the Pilgrim's Progress, by the Presbyterian Board of Publications; No. 211, a variety of books, bound in different styles, with great skill and taste, by D. W. Gihon, of Philadelphia.

As bearing relation to this department, the committee take occasion in this place, to express their sincere thanks to T. F. Adams, for his enterprise in establishing a printing press in the lower saloon, and displaying to the visitors the process of composing, printing, and disposing of a newspaper—by the actual publication, during the exhibition, of a little sheet called "*The Fair*," which attracted great attention, and displayed, on the part of all connected with it, an intimate knowledge of the details of conducting this miniature of the mighty engine of civilization. We take pleasure in awarding him

A Certificate of Honorable Mention.

XVI.—*Paper Hangings.*

Of these articles none have been this year offered for exhibition, notwithstanding the fine opportunity our saloons have offered for

displaying to the greatest advantage every variety of wall paper. This is to be regretted, since we have had other means of ascertaining that this branch of business has attained a degree of excellence which would justify the exposure of its products with advantage to the criticism of any community.

XVII.—*Fine Arts.*

With a single exception, the specimens of the Fine Arts exhibited, are not very meritorious, neither are they very numerous. We make the following awards:—

No. 2063, an American eagle, carved from Italian marble, by John Hill, and designed to adorn the tomb of the late distinguished Commodore Hull, now being constructed by the Messrs. Struthers, is, in all respects, worthy of its destiny, and forms one of the most exquisite pieces of American carving which we have ever witnessed. We take the greatest pleasure in awarding to the able artist who executed it

A Silver Medal.

No. 2040, stucco work, by a pupil of the High School of Philadelphia, is very praiseworthy, and we award it

A Certificate of Honorable Mention.

No. 2004, Daguerréotypes, by Plumbe; No. 1014, do. by Langenheim, and No. 2029, by Root & Collins, all possess a very high degree of merit, and we award to each A Certificate of Honorable Mention.

To Van Loan, of Philadelphia, for some very perfect Daguerréotype pictures, decidedly the best ever exhibited here, we award

A Silver Medal.

The judges notice very favorably, three oil paintings, by W. Gould; a good likeness, by Veron Fletcher; landscapes, by Austin Street; a landscape, by G. W. Holmes; and a beautiful specimen of penmanship, by Ross. This committee have examined with great pleasure two bold and elegant pen drawings, Nos, 2023 and 2026, the former by J. Snyder Leidy, and the latter by B. Eakins, both of Philadelphia. There are other creditable specimens, not, however, requiring minute notice.

XVIII.—*Silver Ware and Jewelry.*

As usual, some very beautiful specimens of Silver Ware have been brought forward by our artizans in that line, and we make the following awards:—

No. 2709, a silver cased chronometer, made by Wm. E. Harpur, is a very neat, beautiful, and, apparently, accurate piece of mechanism; it is entirely of American manufacture, and we award it

A Silver Medal.

No. 1079, a lot of silver ware, made by Bailey & Kitchen, of Philadelphia, containing several articles of superior excellence, particularly a plain pitcher; the whole forming a beautiful display.

A Silver Medal.

The committee notice, with great pleasure, a fluted tea set, by R. & W. Wilson, of Philadelphia, which has been much admired, and fully sustains their high reputation.

The chronometer referred to above, contains several novelties in the construction of the lock, and detent and helical spring.

XIX.—*Bookbinders' Tools.*

The judges express considerable approbation of several of the specimens deposited in this department, and, agreeably to their opinions, we make the following awards: –

No. 56, a lot of copper plates, for engravers, by J. Juery, of Philadelphia. A Certificate of Honorable Mention.

No. 69, very fine specimens of gold leaf, by Otter & Gihon, of Philadelphia. A Certificate of Honorable Mention.

No. 167, specimens of edge gilding, by G. Eckendorf, of Philadelphia. A Certificate of Honorable Mention.

No. 172, a case of specimens of edge gilding, of very fine quality, by James P. Rice, of Philadelphia.
A Certificate of Honorable Mention.

No. 169, impressions of the dies exhibited as No. 168, by Gaskill & Copper, of Philadelphia, are beautiful specimens of the most finished workmanship. A Certificate of Honorable Mention.

No. 2025, a set of dies and embossing plates, by A. C. Morin, of Philadelphia, fully equal to any before exhibited.
A Certificate of Honorable Mention.

The judges speak very highly of No. 168, dies and other ornamental tools, by Gaskill & Copper, of Philadelphia; and this committee award to them, as the most deserving of their class,
A Certificate of Honorable Mention.

XX.—*Marble Work.*

Of Marble Work, we regret to say, that notwithstanding the well known excellence of our artizans in this line, but few specimens have been brought forward, and those few are not of a sufficiently high grade of merit to justify us in awarding them the honors of the Institute.

XXI.—*Hats and Caps.*

The visiters to the present exhibition have, through the enterprize of Charles Oakford, one of our most experienced manufacturers, enjoyed the advantage of witnessing, in the lower saloon, the actual fabrication of hats in nearly all their processes, and the practical manipulations of this ingenious art have deservedly attracted considerable attention. The hats exhibited on this occasion, undoubtedly show a very high degree of finish, and appear to us rather to surpass the specimens shown at any former exhibition. The judges have made a minute report, from which we have decided on the following awards:—

No. 1503, a black beaver hat, and a black silk hat, both superior in material, make, stiffening, and finish, by Charles Oakford, of Philadelphia. A Silver Medal.

The silk hat, in particular, being, in the opinion of the judges, the best exhibited; but it not being customary with us to award two

medals to the same person in the same industrial branch, therefore, we have awarded to Mr. Oakford but one.

No. 1606, a black beaver hat, made by John C. Yeager, of Philadelphia, which is a very creditable article.

A Certificate of Honorable Mention.

No. 1503, a white beaver hat, of elegant style and finish, by Chas. Oakford, of Philadelphia. A Certificate of Honorable Mention.

No. 1515, a black nutria hat, made by Orlando Fish, of New York, which is a very beautiful article.

A Certificate of Honorable Mention.

No. 1606, a black nutria hat, made by John C. Yeager, of Philadelphia, in a very fine style and finish. A Silver Medal.

No. 1515, two black silk hats, by Orlando Fish, of New York, pronounced by the judges to be very superior; the committee award

A Silver Medal.

There were also exhibited several muffs, boas, and caps, which, in the opinion of the committee, are of very admirable construction and finish.

XXII.—*Combs and Brushes.*

The judges declare the opinion that the workmanship of the articles in this department sustains very fully the reputation of the artizans in this branch of industry. The committee make the following awards—

No. 1566, one case and three cards of brushes, by C. D. Thum, of Philadelphia; these are all very creditable, and some of them very superior articles, both in materials and workmanship.

A Silver Medal.

No. 1547, brushes, &c., made by the blind at the Pennsylvania Institution, in Philadelphia; these articles possess no peculiar merit merely as brushes, but as brushes made by persons deprived of sight, they are truly creditable, and well deserve

A Certificate of Honorable Mention.

Nos. 1512, 1523, 1828, and 1599, consisting of combs, made by A. Simpson, T. Simpson, Jonas Colburn, and P. C. Noyes, though not particularly prepared for exhibition, were deservedly admired, and, in our opinions, justly add to, and are worthy of, the reputation of their makers.

The judges speak approvingly of No. 1541, a lot of fancy bellows, of very good quality.

XXII.—*Coach Work.*

The specimens in this department, though not very numerous, evince, we think, the fact, that this manufacture has also progressed during the past year. Several very creditable articles came too late for competition, or notice, by the judges. We make in this branch the following awards:—

No. 1270, a substantial and beautifully finished coach, made by Vansciver & Son, of Philadelphia, attracted general attention, it deserves great credit for the skill and taste displayed in its construction

and would certainly have received the highest premium in this branch of art, if it had come in time for competition.

No. 2597, a Rockaway chariotee, of very good materials and workmanship, by Vansciver & Son, of Philadelphia.

A Certificate of Honorable Mention.

XXIV.—*Leather and Morocco.*

It has been very justly remarked, that this is a most important manufacture—in fact, very few are more so—and it gives us much pleasure to learn from the judges, that in several of its branches very decided improvements have been made over the showing of former years. These improvements, and the general excellence of the numerous specimens displayed, justify the following awards:—

No. 530, Japanned leather, by the Boston Manufacturing Company, deposited by J. W. Patten, of Philadelphia, displaying a clear superiority over similar articles formerly exhibited.

A Silver Medal.

No. 543, binding skins, by Robert Emes, of Abington, Pennsylvania, pronounced to be a very superior article, and deposited by D. C. Spooner, of Philadelphia. A Silver Medal.

No. 584, bag hides, tanned by C. B. Williams, of Philadelphia, and finished by Wm. F. Forepaugh, are very fine samples of a most valuable kind of leather, and, for the finishing, we award

A Silver Medal.

No. 2545, sole leather, tanned by C. B. Williams, of Philadelphia, a very fine article indeed. A Silver Medal.

No. 2559, sole leather, tanned by Wm. H. Crawford, of Philadelphia; also a very excellent specimen of its kind. A Silver Medal.

Do. 575, russet bridle leather, and some well tanned bag hides, showing good workmanship, made by Scattergood & Bousted.

A Certificate of Honorable Mention.

The following articles, for their workmanship, and apparently excellent quality, deserve high praise, but were not thought to possess a superiority quite sufficiently marked to entitle them to premiums, though better specimens are not frequently to be found in the general market, viz:—

No. 2651, a very fine and large enameled chaise hide, tanned by H. & G. Fricke, of Philadelphia, which came too late for competition.

No. 2650, an unusually large and well finished chaise hide, of the old style, by Pyle & Co., of Wilmington, Delaware, attracted much notice, also too late for competition.

No. 147, a lot of remarkably well tanned and finished sheepskins, in the wool, by Thomas Clough, of Philadelphia, which are certainly very creditable to the workmen.

The calf-skins and moroccos exhibited, are certainly very fine, but do not seem to possess a very marked superiority over the products of past years.

XXV.—*Boots and Shoes.*

These very important products of industry exhibit, the present

year, very great beauty of workmanship, combined with great apparent excellence of material; in fact, the specimens now on deposit superadd to a very neat finish, strong promise of durability. In accordance with the opinion of the judges, we make the following awards:—

No. 226, one case of ladies' boots and shoes, by William Ryan, of Philadelphia, samples of fine dress articles, the quality and style of which are much commended by the judges. A Silver Medal.

No. 514, a pair of ladies' gaiter boots, made by J. Rottenbury, and deposited by McIntosh, of Philadelphia, esteemed to be a very excellent article. A Certificate of Honorable Mention.

No. 550, three pair of gentlemen's fine boots, by L. Benkert, of Philadelphia, of admirable workmanship, and decidedly the best exhibited. A Silver Medal.

No. 588, two pair of gentlemen's boots, by C. Benkert, of good and durable quality, and neat fashion.

A Certificate of Honorable Mention.

The judges notice in terms of approbation, as neat and serviceable articles, No. 533, five pairs of boots, deposited by John Ryan, of Philadelphia, and No. 538, nine pairs of boots, deposited by Joseph Hill, of Philadelphia; we award to both

Certificates of Honorable Mention.

Some kid shoes, spring clogs, lasts, and other articles, deposited by various parties, appear to be well made, but not sufficiently distinguished to require a more minute notice.

XXVI.—*Chemicals, &c.*

The chemical articles exhibited display a variety and excellence which is very gratifying. The chemicals of commerce, manufactured upon a large scale for the general market, show a decided improvement, and the specimens of them now exhibited deserve and receive the highest approbation from this committee. The chemists who formed the board of judges in this division, have made a minute report, in conformity to which the following awards have been decided on:—

No. 551, commercial chemicals, by Farr, Powers & Weightman, of Philadelphia; a very admirable display of superior articles.

A Silver Medal.

No. 536, chemical preparations, by Smith & Hodgson, of Philadelphia; a very beautiful lot of specimens.

A Certificate of Honorable Mention.

No. 518, prepared spermaceti, by Alexander H. Campbell, a most superior article. A Certificate of Honorable Mention.

No. 549, the best perfumery, prepared by Eugene Roussell.

A Certificate of Honorable Mention.

No. 522, to Jules Hauel, of Philadelphia, for decided improvements in perfumery since last year, A Certificate of Honorable Mention.

No. 528, transparent soap, by H. P. & W. C. Taylor, of Philadelphia, a truly elegant article. A Certificate of Honorable Mention.

No. 564, common soaps, by J. R. Graves, of Philadelphia, of the

kinds usually employed in the arts; in consideration of superior quality, cheapness, and their production on a great scale,

A Silver Medal.

To Roussel, of Philadelphia, the well known perfumer, for mineral water, made in stone, or glass, vessels, and therefore, entirely free from any taint of copper; we award

A Certificate of Honorable Mention.

The judges notice in terms of approbation the following articles:—

Extract of indigo, by A. Gund; Barnhill's indelible ink, by Potts, Linn & Harris; sugar, (refined) by Lovering & Co.; chemicals, by Dillwyn Parrish; magnesia, calcined and fluid, by Thomas J. Husband; chemical preparations, by J. Taylor; oils of hemp seed and peach kernels, by Edward Ryan; cyanide of potassium, by H. Worthington; chemicals, by William Proctor, jr.; Seidlitz powders, by Haskell & Merrick; mustards and spices, by Messrs. Fell; chemicals, by Edward Parrish; pine oil, or camphine, by Benjamin T. Davis, a very fine article; isinglass, by Delacour; chocolate and cocoa, by J. Schmitz; starch, by Altemus; polishing rouge, by Mrs. West; perfumery, by Hinton, and by Wetherill.

Many of these articles really possess great merit, and the committee think a slight, but marked, superiority over similar specimens hitherto exhibited. The extreme beauty of the refined sugars, manufactured by Joseph S. Lovering & Co., of Philadelphia, challenged our highest admiration, and we only suspend the award of a silver medal to them, in order to give time for a minute examination by a special committee. In like manner we propose to have some tests made of the fine indelible inks of Potts, Linn & Harris, with the view of awarding them a certificate of honorable mention, if the results should be such as we anticipate. We also propose, with the same object, to submit Messrs. Haskell & Merrick's Seidlitz powders to a sufficient test.

XXVII.—*Philosophical Apparatus.*

The display of Philosophical Apparatus, is not, this year, so extensive as it might have been made, by a little more exertion on the part of the artizans in this branch; nevertheless, those specimens which are deposited must be regarded as very creditable. Agreeably to the sentiments of the judges, we make the following awards:—

No. 2710, an analytical balance, by J. P. Duffy, of Philadelphia, is very neatly finished, judiciously mounted, and, on a test by the judges, turned sensibly with the half of a millionth part of its load; we award it

A Silver Medal.

Nos. 1016 and 1025, fine specimens of mechanical, optical, and electro-magnetical apparatus, by J. P. Duffy, of Philadelphia.

A Certificate of Honorable Mention.

Nos. 1126 to 1128, electrical and electro-magnetical apparatus, made by J. Bishop, of Philadelphia.

A Certificate of Honorable Mention.

To A. Prince, optician, of Philadelphia, for some very well executed Stanhope lenses, believed to be the first ever made in this country, we award them

A Certificate of Honorable Mention.

No. 1045, the perifocal spectacles of H. M. Paine, of Mass., deposited by E. Borhek, of Philadelphia, appear to be well made, and are pronounced to be very superior in numerous certificates. They should, we think, be referred to the committee on Science and the Arts.

No. 2623, counter scales and prescription balances, made by T. Meyer & Co., and deposited by Gray & Brother, appear to be well proportioned and finished.

The brass clock, No. 1033, by C. Gilbert, is a fair specimen of these useful and very cheap meters of time.

XXVIII.—*Straw Goods.*

We are happy to have it in our power to state, that in this department the judges announce a very decided improvement over the products of former years; and, agreeably to the opinion expressed by them, we announce the following awards:—

No. 1534, edgings for bonnets, made of hair and straw, twenty-two pounds in all, manufactured by Joseph Weed, of Philadelphia, an article deserving the highest praise as a domestic fabric; made entirely of material the growth and production of this country, and, as being, in fact, superior to any thing of the kind, foreign, or domestic, heretofore put on sale in our market. A Silver Medal.

No. 1603, bonnet wire, by James Bird, of Philadelphia, very elastic, and beautifully covered with silk, in various styles.

A Certificate of Honorable Mention.

The judges also notice with approbation, some very good specimens of dyeing on straw goods, by James Bird, of Philadelphia.

XXIX.—*Surgical Instruments.*

In this department, pursuant to the recommendations of the judges, we make the following awards:—

No. 2043, a case of porcelain teeth, deposited by Dr. E. Wildman, of Philadelphia, which have successfully stood the tests applied by the judges. A Silver Medal.

No. 1019, table for dental instruments, made by Henry Habermehl, of Philadelphia, of excellent workmanship, and very conveniently arranged. A Certificate of Honorable Mention.

No. 1078, a set of dental instruments, by Jacob H. Gemrig, of very fine workmanship and finish. A Certificate of Honorable Mention.

No. 1099, a lot of emery composition, grindstones, and whetstones, deposited by Samuel S. White, of Philadelphia, deserve a certificate, but came too late.

No. 1064, a lot of artificial teeth, deposited by Goodwin & Mitchell, of Philadelphia, deemed by the judges to be very creditable.

A Certificate of Honorable Mention.

The judges notice favorably, No. 1041, a case of porcelain teeth, deposited by Crispenn & Henck, of Philadelphia; No. 1049, a case of artificial teeth, deposited by A. R. Johnson, of Philadelphia; No. 1067, a grinding machine, deposited N. L. Dickey, of Philadelphia; a drill, in case No. 1067, is referred to as being very ingenious; No.

1093, a lot of artificial teeth, deposited by John M. Crowell, very good in every point except vital appearance.

XXX.—*Gum Elastic Goods.*

In this branch of manufacture, which, as is well known, has not been very long established, the committee hail with satisfaction a very decided improvement. The judges, in a very minute report, speak in the strongest terms of favor of the Caoutchouc manufactures of Mr. Goodyear, and, in conformity to their opinions, we make the following awards:—

No. 511, a lot of three trunks full of India rubber goods, made by Charles Goodyear, of Naugatuck, Conn., deposited by Dulles, Aertson & Fisher, and comprising a great number of articles of utility made from gum, so prepared and laid on textile fabrics as to preserve in the highest degree, its peculiar properties under all the vicissitudes of heat, cold, and moisture in our climate. A Silver Medal.

No. 541, a case of admirably made India rubber shoes, manufactured by John L. Ripley, of Philadelphia.

A Certificate of Honorable Mention.

The judges notice favorably, No. 501, a case of India rubber articles, made by Horace H. Day, and No. 529, ditto, manufactured by the Hotchkiss and Merrimac Manufacturing Company.

In conclusion, the committee are much gratified to see the continual new applications which are being made of this most interesting manufacture.

XXXI.—*Copper, Brass, and Plumbers' Work.*

A number of meritorious articles of Brass, and Plumbers' work were brought in too late for examination by the judges, and we regret therefore, that they cannot receive the notice they deserve. We make in this department the following awards:—

No. 2576½, one large church bell, of very admirable tone, made by Lewis Debozear, of Philadelphia.

A Certificate of Honorable Mention.

Some braziers' solder deposited, is well spoken of by the judges.

XXXII.—*Tin Work.*

The judges in this department, in a minute report, have detailed the various articles, and their merits, of many of which they speak very highly. It appears that Williams & Co., of Philadelphia, are the chief depositors in this branch, and the committee are gratified in making the following award:—

No. 2605, by Williams & Co., of Philadelphia, an extensive lot of household articles, comprising most of the articles of tin ware in common domestic use, and the whole of which are well fashioned, substantially made, and skilfully finished. A Silver Medal.

In this lot of tin ware the judges take especial notice of some very well arranged and well constructed portable shower baths; they also speak favorably of Johnson's patent ice-cream freezer, of which it seems that extensive sales have been made, giving much satisfaction to the purchasers.

XXXIII.—*Paints and Colors.*

In these very useful articles the committee think they notice some decided improvement, and, agreeably to the recommendations of the judges, who have given to the various specimens that minute examination requisite for the formation of correct conclusions in such cases, we make the following awards:—

No. 515, white and red lead, by George Uhler, of Philadelphia, to the former for its superior whiteness, fineness, and body, to the latter for its depth and brilliancy of color. A Silver Medal.

No. 579, lamp black, by Thomas Matlack, of Philadelphia, for its superior blackness, fineness, and purity, would have received a certificate if it had arrived in time.

We notice also, as deserving of high praise, the vermillion by Farr, Powers & Weightman, of Philadelphia.

XXXIV.—*Fancy Articles.*

The number of articles in this branch, submitted to the judges, is not so large as in previous years, a new committee having been appointed on "Clothing and Needlework," which division comprises many articles formerly placed among "Fancy Goods."

The committee on fancy articles have observed, with much interest, the increase in the manufacture of a vast number of articles in this department, formerly mostly imported from Europe, such as toys, artificial flowers, and various other things, both useful and ornamental, which, if made in our own country, would afford means of support to many an industrious female and aged person.

The committee notice with particular commendation, No. 1509, a case of artificial flowers, made and deposited by James D. Brown, of Philadelphia, manufactured of foreign material, but displaying a beauty in form and design surpassing any ever exhibited. They deem these flowers worthy A Certificate of Honorable Mention.

No. 1536, a case of wax fruit, by Miss M. George, is beautifully executed, and worthy A Certificate of Honorable Mention.

No. 1540, a case of wax fruit, by Miss C. A. Smith, is very well made, and deserves commendation.

No. 1545, a national flag, made entirely of American silk, is a rich and beautiful article; the committee awarded to W. H. Horstman, of Philadelphia, the maker, A Certificate of Honorable Mention.

No. 1552, a lot of fly brushes, displaying great taste and skill in the manufacture, made by Jacob Wilt, is judged to deserve A Certificate of Honorable Mention.

No. 1617, a very large assortment and variety of bottled pickles, tastefully disposed upon a stand in imitation of a temple of liberty, surmounted by an American eagle, is a conspicuous object in the exhibition, and has been much admired. The depositor, T. B. Smith, obtained a medal at the exhibition of last year; but for the improvement in the design of his display, as well as for the excellence of the articles deposited this year, the committee think him entitled to A Certificate of Honorable Mention.

No. 1571, a case of fancy baskets, by Miss A. Williamson, a neat, convenient, and beautiful article, worthy of

A Certificate of Honorable Mention.

No. 1583, a case of splendid wax fruit and flowers; among the flowers is an admirable imitation of the *Nelumbium Luteum*, a rare and beautiful flower, which we have never before seen attempted; to the maker, Mr. C. Girdon, is awarded

A Certificate of Honorable Mention.

To some beautiful bronze castings of miniature statues of Washington, Napoleon, and Guttemberg, by Mr. Doflein, who obtained a premium at the last exhibition, we award

A Certificate of Honorable Mention.

To Mr. and Mrs. Burns, of the Franklin Female Institute, Chambersburg, Penna., for a very novel and beautiful map of the State of Pennsylvania, executed in lace work, and showing each county in a different stitch, we award A Certificate of Honorable Mention.

To some very elegant French plaiting, No. 1542, by Madam Juery, of Philadelphia, we award A Certificate of Honorable Mention.

The committee regret that many meritorious articles in this branch of the exhibition were brought too late to come under the notice of the judges.

XXXV.—*Household Articles.*

In this department, comprising the miscellaneous articles of domestic comfort which scarcely come within the scope of other regular industrial divisions, the committee notice with pleasure a number of articles, the comfort and convenience of which they have already, in their private relations, had an opportunity of testing.

On the basis furnished by the examination of competent judges, we make the following awards:—

To Oliver Evans, of Philadelphia, for No. 2504, a provision chest, containing a refrigerator and water filter, the whole being arranged upon a good plan, and the workmanship being decidedly superior to any thing of the kind now exhibited.

A Certificate of honorable Mention.

No. 2543, articles of cedar ware, by Samuel Tompkins, of Philadelphia. A Certificate of Honorable Mention.

No. 2548, refrigerators and provision safes, made by Evans & Watson, of Philadelphia, lined with slate, which are very superior articles.

A Certificate of Honorable Mention.

No. 2565, brooms and hearth brushes, by Manly Rowe, of Philadelphia, being most excellent articles.

A Certificate of Honorable Mention.

No. 2588, willow baskets, by W. D. Hart, of Philadelphia, esteemed to be very good of their class. A Certificate of Honorable Mention.

The judges speak very favorably of No. 2610, a table, a roaster, and a churn, all very useful articles, by Gideon Cox, of Philadelphia; No. 2631, bread, baked by F. S. Reed. of Philadelphia; and finally, to No. 2538, two barrels of flour, both good, but that made by James

Patterson, of Brighton, Penn., being a very superior article; we award the latter A Certificate of Honorable Mention.

No. 2573, brooms and wooden ware, by George Chipman, of Philadelphia. A Certificate of Honorable Mention.

No. 2555, wooden ware, deposited by E. H. Jones.
A Certificate of Honorable Mention.

XXXVI.—*Clothing and Needlework.*

In this comparatively humble, yet extremely important branch of economical industry, we observe with pleasure quite an extensive display of articles, the great majority of which are very creditable to the hands who fashioned them. To those of the most particular merit, in the opinion of the judges, we make the following awards:—

No. 1580, two scarfs, very well made, by J. D. Brown, of Philadelphia. A Certificate of Honorable Mention.

No. 1591, a case of shirts, by G. W. Ward, of Philadelphia, the best exhibited, especially in the cutting and fitting.
A Certificate of Honorable Mention.

No. 1592, a coat made by Francis Mahan, in all respects very well done. A Certificate of Honorable Mention.

No. 1595, a piano cover, made by Margaret Gillespie, the best exhibited both in design and quality.

No. 1596, lace work, by Miss E. Isaacs, is very beautiful.
A Certificate of Honorable Mention.

No. 1603, ladies' gloves, by J. R. Ashford, of Philadelphia, the best ever exhibited. A Certificate of honorable mention has been awarded by the judges of silk goods.

No. 1613, a case of very fine wrappers, by Henry V. Wright, of Philadelphia. A Certificate of Honorable Mention.

To Mrs. Rapp, of Philadelphia, for sundry specimens of the most elegant style of needlework, which have been universally admired.
A Certificate of Honorable Mention.

To Mrs. L. Dingee, of Philadelphia, teacher of shell and wax work, for No. 1585, a vase of very elegantly made, and tastefully arranged, artificial flowers, A Certificate of Honorable Mention.

To Mrs. S. A. Sendos, of Philadelphia, for No. 1514, a gentleman's shirt, of which the needle work is deemed to be finely executed.
A Certificate of Honorable Mention.

Nos. 1506 and 1508, cases of shirts, clothing, and stocks, by C. A. Walborn, of Philadelphia, are very well deserving of notice, but Mr. Walborn being a member of our Board of Managers, the regulations prevent our offering him a premium.

No. 1548, a bed quilt, deposited C. A. Hallowell, is very beautiful, both in design and execution.

No. 1600, ladies' gloves, by William Hawkins, are very fair goods of their kind, and a certificate of honorable mention has been awarded them by the judges of silk goods.

This committee notice with much approbation a fine display of gentlemen's shirts, and other clothing, by J. Hodges, of Philadelphia.

Having now given to the most meritorious articles displayed in the

fourteenth exhibition of the Franklin Institute, as extended a notice as was possible, within reasonable limits; having awarded to those who, in our opinions, after a careful examination, appeared to be *the most deserving*, fifty-nine SILVER MEDALS, and one hundred and fifty-four *Certificates of Honorable Mention*, in finally concluding this report, we should do great injustice to our feelings if we omitted to return our sincere thanks to the judges of the various departments, who have liberally devoted their time to an examination of the various articles, in such a minute and impartial manner, that we feel great confidence in the justice of the awards in the various industrial departments, in making which their opinions have given us the necessary basis for our guidance.

In taking leave of this respectable audience upon the present occasion, for another year, we do it in the buoyancy of a high hope that the skill of American artizans may improve in the year forward, as it undoubtedly has done during the one now terminated.

AMERICAN PATENTS.

List of American Patents which issued in April, 1844, *with Remarks and Exemplifications. By* CHARLES M. KELLER, *Examiner of Patents.*

1. For protecting the polished surface of *Metallic Reflectors, or Mirrors*, by means of glass; Alonzo Farrar, Boston, Massachusetts, April 4.

Claim.—"I claim the combination with a parabolic, or concave, reflector, or mirror, as ordinarily constructed, or the applying, or fitting, to the polished, or reflecting, surface of the same, of a concave surface of glass, or a concave glass lens, or meniscus, made perfectly symmetrical with said surface oppositely adapted to the same; all the exposed edges of the lens, or reflector, being hermetically, or otherwise, sealed, so as to be air-tight; the whole being constructed substantially as set forth, and for the purpose specified."

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2. For an improvement in the *Cooking Stove;* Roswell Bush, Rochester, Monroe county, New York, April 4.

The improvement consists in dividing the whole stove longitudinally, by means of vertical plates extending through the fire chest, or chamber, ovens, and flues, thus making two fire chambers, two ovens, and ten flues, where there were only half that number previous to the addition of said vertical division plates, and enabling the user to heat it in part only, or wholly, at pleasure. This stove has a diving flue between the fire chamber and oven, which flue extends under, up, back of, and over the oven; and at the upper front edge of the oven there are two dampers, one for each chamber, either to force the current of draught around the ovens, or permit it to pass directly

out of the pipe; and there are, of course, two corresponding flues at the back. For the purpose of causing the draught to pass entirely around the oven, there is a division plate in the flue space above the oven which extends from the back plate of the oven to within a short distance of the front of the oven; the draught after passing up the back flue goes under this horizontal division plate to the front of the oven, and then over the division plate to the chimney.

Claim.—"I do not claim the fire chamber and oven, and the flues at the end of, and beneath, the oven of a divided cook stove; but what I do claim as my invention in stoves thus divided, and which I desire to secure by letters patent, is the combination of the vertical division plates with the horizontal division plates, in the manner and for the purpose set forth."

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3. For an improvement in the machine for *Washing Clothes;* Lewis Woodward, Medford, Burlington county, New Jersey, April 4.

In this machine the clothes are to be washed by means of a fluted roller, and a brush below it, which is attached and borne up to the roller by weighted levers.

Claim.—"What I claim as my invention, is combining a revolving fluted roller with an adjustable flexible brush, in the manner and for the purpose described."

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4. For an improvement in the *Saw Gin*, for ginning cotton; Eleazer Carver, Bridgewater, Plymouth county, Mass., April 4.

We are informed by the patentee, that the "improvement is designed to protect and hold the fibres of cotton while on the teeth of the saws, in such a manner as to enable the brush to operate more perfectly in taking the cotton off from the teeth of the saws in loose and uniform quantities. In the operation of the common gin, as the saw cylinder revolves, the teeth of the saws catch and draw the fibres of cotton away from the seeds through the grate; after which these fibres are swept, or blown, off from the teeth by a rapidly revolving brush, and thrown out at the back side of the gin. These fibres, however, as they come through the grate aforesaid, are bent backwards around the teeth of the saws, so that the loading of every tooth, to some extent, becomes intermixed and connected with the loading of each succeeding tooth, and they thus adhere together, insomuch that the brush is apt to take off, or draw off, from the saws more than it actually comes in contact with, and more than it should do in order to separate and straighten the fibres properly. This difficulty is also increased by the wind which is produced by the brush, which frequently loosens the cotton on the teeth of the saws before they have revolved far enough to come within the proper action of the brush, so that in the common gin the brush takes the cotton through the machine in masses too large, and in a doubled, connected, and improper state." These evils are obviated, and the fibres straightened in the act of brushing, by means of guards, which are attached to the back of the ribs, and extend down some distance below the line

where the saws pass out of the ribs; these hold the fibres whilst the brush acts upon them.

Claim.—"I claim as my invention, the guard for protecting and holding the fibres of cotton, while on the teeth of the saws, for the purpose herein set forth, and applied substantially in the manner herein described."

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5. For an apparatus for *Fitting Ladies' Dresses*, denominated the "trimeasure rule;" Samuel S. Richardson, Baldwin, Cumberland county, Maine, April 4.

"The apparatus consists of a measure and corresponding diagram; the measure is made of oiled linen tape, or other fabric, forty-five inches in length, and is adapted to three separate admeasurements."

Claim.—"What I claim, is the mode herein described, of fitting ladies' dresses by the combined use of the triple-measure and diagram, both graduated in the manner described."

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6. For an improvement in the *Truss Frames of Bridges*, applicable to other purposes; Thomas W. Pratt, Norwich, Connecticut, and Caleb Pratt, Boston, Massachusetts, April 4.

In each panel, or between every two posts, there are two diagonal tension braces, or screw rods, crossing, each extending from the bottom of one post to the top of the other; these rods pass through straining blocks at top and bottom, against which the nuts, on the tension rods, act.

Claim.—"We claim the above described method of constructing a truss, that is to say, the combination of two diagonal tension braces and straining blocks in each panel of the truss frame of a bridge, by means of which the camber may be regulated so as to increase, or diminish, it, either in whole, or in sectional parts, of the bridge, the whole being constructed and operating substantially as set forth."

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7. For improvements in *Mills for crushing and grinding Corn*: Samuel L. Herr, Mexico, Juniata county, Penna., April 4.

The mill in question consists of two vertical disk grinders, one permanent, and the other a runner; the outer portion of their faces is formed in the usual manner of grinders, and the inner portion provided with cutters for slicing the cobs, and sharp pointed teeth for reducing the slices preparatory to the grinding. The permanent disk has a hole through it, and a hopper to introduce the corn and cobs to the parts provided with cutters and teeth; there being one knife at the edge of the opening, and two knives on the runner.

Claim.—"I do not claim attaching knives to a runner, as that has already been done, neither do I claim forming the disk with teeth and ribs, which has been before effected, but what I do claim as my invention, and which I desire to secure by letters patent, is the combination of the teeth and ridges with the knives, in the manner described; the whole being constructed and arranged for the purpose set forth."

8. For an improvement in the *Cotton Seed Planter;* Dierck Brewer, Petersburg, Lincoln county, Tennessee, April 4.

To the bottom of a hopper, or box, mounted on wheels, there is an inclined shoe, which is shaken by means of an arm extending from the side of it, and acted upon by teeth on the face of one of the wheels; passing through this hopper, and just above the shoe, there is a roller, or axle, armed with spikes, to distribute the seeds, and cause them to be discharged from the shoe into the furrow, made by a tooth, or coulter, at the forward part, and covered by a drag at the back of the machine. The roller, or axle, is provided with a pinion at one end, which takes into teeth on the face of one of the wheels.

Claim.—"What I claim as my invention, is the combination of the axle and vibrating shoe with the seeding machine, constructed and arranged in the manner and for the purpose described."

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9. For an improvement in *Cooking Stoves;* Abner Leland, Milton, Northumberland county, Pennsylvania, April 4.

In this stove the fire chamber is above the oven, and the flue spaces along the sides, bottom, and back; the side plates of the oven extending up near to the top plate of the stove. There is a space between the bottom of the grate and the top plate of the oven, and as the grate is much smaller than the oven, there is a plate that extends from the back of the grate to the back of the stove, which plate and grate are to be removed, when wood is to be substituted for coal. The draught passes from the fire chamber over the side plates of the oven, (which are, as before stated, extended nearly up to the top plate of the stove,) passes down, and enters the bottom flue through two openings in the side plates near the front of the stove, and from the bottom flue it passes into the back flue, and out into the chimney. The back part of the top plate of the oven is cut out and provided with a grate, which leads, by means of inclined tubes, into the back flue, for the discharge of ashes, which is drawn out through a door that opens into the bottom flue.

Claim.—"What I claim as my invention, is the open space between the fire chamber and oven, and, in combination therewith, the ash tubes with their grate for discharging the ashes."

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10. For an improvement in the mode of *Connecting a Carriage Body with the Perch;* George Nichols, Trumbull, Fairfield county, Connecticut, April 10.

This is for an improvement on a patent previously granted to Stephen Tomlinson, on the 16th of May, 1842, which has not yet been noticed in this Journal.

Claim.—"I do not claim connecting the body of a carriage with the perch, by means of longitudinal springs, as that has before been done, the springs being firmly connected at each end; but what I do claim as my invention, and desire to secure by letters patent, is the combination of the spring stay braces with the perch, by means of

bolts passing through slots in the ends of said braces, in the manner and for the purpose described."

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11. For improvements in machinery for *Pecking, or Dressing, Stone;* Hammond Ward, Charlestown, Worcester county, Massachusetts, April 10.

The block of stone to be pecked and dressed is placed upon a carriage, which passes it, by a slow motion, under a series of pecking and dressing chisels. These chisels slide in a frame inclined to the plane of the carriage, that they may act on the stone obliquely, instead of vertically, and, for the purpose of changing this inclination, one end of this frame is jointed to the main frame of the machine, and the other may be elevated and depressed at pleasure. The chisels are held up by springs, and forced against the face of the stone by hammers actuated by tappets on two shafts, one at each end of the frame. The first and second rows of these chisels are pointed, for the purpose of pecking, and the others are flat, for dressing the surface. For squaring, or forming, the edges of the stone, there is a chisel on each side, with the lower edge at right angles with the side, and operated in the same manner as the peckers and dressers; these break off the stone, and form the edge, so that when the block is turned over to have the other faces dressed, the sharp corners shall not be broken off.

Claim.—"I claim the manner by which I am enabled to vary, or alter, the inclination of the cutting chisels, with respect to the plane, or face, of the stone to be dressed, viz., by sustaining, or arranging, the stocks, or spring holders, of the chisels in a movable frame, which shall turn on centres, or bearings, disposed at one end thereof, or any other suitable part of the machine; also the combination with the series of cutters for dressing the top surface of the square, or blunt, edge cutter, or cutters, for the purpose of forming the square corner, or edge, of the stone, as set forth."

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12. For an improvement in the *Pump;* T. Jefferson Wolfe, Baltimore, Maryland, April 10.

The pump chamber instead of being cylindrical, as generally made, is in the general form of a hand bellows—the discharge valve being in the top, the discharge pipe extending up from it, and the admission valve in the bottom, which is hinged to the top at one end, and to the connecting rod at the other.

Claim.—"What I claim as my invention, is the mode in which I have constructed my forcing pump; that is to say, by placing the forcing chamber, constructed as described, under the water line, the valves and piston, or connecting rod, being arranged and operating substantially as set forth. I also claim, in combination with the above, placing the piston, or connecting rod, and the discharging passage for the water, in separate bores of the pump log."

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13. For a *Current Water Power*, to be substituted for water-wheels in mills; John Carnegy, Tulley, Lewis county, Missouri, April 10

The patentee says,—"My apparatus is of that kind in which a number of buckets are affixed to two, or more, endless chains that pass around suitable drums, to which said chains are geared by teeth on said drums, the teeth taking into the links of the chains. The buckets are to be attached to the chains by hinge joints, so that they may fall over and lie flat upon the chain, as they are carried back on the upper side of it. The chains and buckets, with their appendages, are to be secured in a proper frame, constituting a part of a hollow trunk, sustained by two floats, or buoys, in such manner as that the whole apparatus shall rise and fall with the rise and fall of the current in which it is placed." Chain paddles have long since been attempted, but set aside because nearly the whole force of the current is expended on one paddle only, which cuts off the action of the current from the others: with the view to obviate this defect, the patentee describes the application of gates to each side and bottom of the hollow trunk, each succeeding gate being extended out farther than the preceding, to catch the current, and conduct it on to the paddles.

Claim.—"What I claim as new, is the employment of a series of buckets which are connected by hinge joints to two, or more, endless chains, in the manner set forth; the shafts of which buckets are furnished with friction wheels, or rollers, that run between ways below and above them, and have stop pieces that extend back, so as to come into contact with a link of the chain in the immediate vicinity of the next succeeding bucket, in the manner and for the purpose made known, which endless chains of buckets, so arranged, I intend to combine with a floating trunk furnished with wing gates, and otherwise constructed as described."

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14. For improvements in *Clocks;* Frederick Kesselmeier, Wooster, Wayne county, Ohio, April 10.

"The nature of this invention consists in combining with a clock of common construction, a balance pendulum, or regulator, and an improvement in the striking part; any escapement may be used, but preference is given, by the patentee, to the dead beat escapement in any of its modifications.

Claim.—"What I claim as my invention, and desire to secure by letters patent, is the balance pendulum, or regulator, constructed in the manner specified; I also claim the cam wheel for moving the hammer, combined with the striking parts of the clock."

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15. For an improvement in *Smut Machines;* Samuel Scammon, and Rufus Nason, Waterville, Kennebec county, Maine, April 10.

Claim.—"What we claim is the method of creating an upward current of air, by fans placed at the bottom of the inner cylinder, and admitting air at the top, instead of the bottom, of the cylinder, as is now used, by which we obviate the difficulty explained. We disclaim the invention of the machine, and all parts of it, except the fans, and the method of introducing the air, in the manner and for the purpose specified."

The object of introducing the air at the top, instead of the bottom, is to avoid forcing in air in which is suspended the impurities that have been discharged from the grain.

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16. For improvements in the *Cooking Range;* Julius Fink, Philadelphia, Pennsylvania, April 10.

The two ends and the front of this range constitute five sides of an octagon; the middle division forming the front of the fire chamber, and the division next to it on each side, the front of an oven—the one on the right being designated, in the claim, by the letter B, and the other by the letter C. The fire chamber, which is triangular, is formed by one side of each of the ovens, the one on the right being deeper than the other, and extending to about the middle of its width. The draught from the fire chamber is divided; one portion passes over the oven C, down a diving flue G, at the opposite side, under and up through a flue H, between the back of the oven C, and that portion of the side of oven B, which extends beyond the fire chamber, and then escapes into the chimney through a flue I. The other portion of the draught passes over the oven B, down a diving flue G', at the side opposite the fire chamber, under, and up a flue space I. There is a tube, or trunk, open at both ends, which passes through the bottom flue space of oven B, to form a communication between the ash pit, and a flue, K, which communicates with an independent flue, K', to carry off the fumes, or vapor, arising from the ash pit.

Claim.—"What I claim as new, is the manner in which I have combined and arranged the fire chamber, and the ovens B and C, the former being triangular in its horizontal section, and having one of its backs in contact with one side of the oven B, and the other in contact with one side of the oven C; by which arrangement I am enabled, not only to heat said ovens directly, but also to give to one of them a much greater depth than can be attained in a range of the same length, if made in the usual form. I claim, in combination with the foregoing, the particular manner in which I have arranged the flues of the respective ovens; the draught of that marked C, after passing down the descending flue G, ascending in the flue H, thereby aiding in heating the rear of the oven B, and finally escaping into the flue space I; the flue of the oven B, also descending through the flue G', on one side of it, and escaping into the space J, through an opening herein designated by the letter C''. I claim the arranging of the tube, or hollow trunk, for the conveyance of a draught of air from the ash pit through the flue space under the oven B, and into that designated by the letter K, to be conveyed off by the independent flue K.'

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17. For a composition of matter called *Garrison's Compound Balsam of Liverwort Candy;* Henry and George Garrison, Newburg, Orange county, New York, April 10.

This is for making a candy, by mixing the following ingredients, viz:—"Sugar, 108 parts of extract; sarsaparilla, 5 do.; liverwort, 4

do.; thoroughwort, 5 do.; horehound, 8 do.; olive oil, 1." We are informed in the specification, that this compound is intended as a specific for "all pulmonary affections leading to consumption."

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18. For an improvement in *Cooking Stoves;* Frederick Kesselmeier, Wooster, Wayne county, Ohio, April 13.

We have here a stove of a quadrangular form, with the oven by the side of the fire chamber, the two being separated by a partition plate; and at the upper back corner this partition is pierced to admit the draught to pass down a flue at the back of the oven, from which it passes to a flue at the side, and then through a hole in the plate, which forms the side of the oven, to a flue between the back plate of the oven, and the back flue first described, and thence along the top flue to the funnel, or pipe, at the top. The top plate of the stove is provided with boiler holes, having flanches that extend up, and are united to corresponding holes in the top plate of a jacket, or case, which surrounds the whole of the stove, leaving a hot air chamber all around the stove for heating air to be conducted into upper apartments, in a space between the smoke pipe and a jacket surrounding it.

Claim.—"What I claim as my invention, is covering the stove with a case in the manner described, so that the flanches around the boiler holes shall connect with said case for the purpose specified. I also claim the combination and arrangement of flues herein fully described, by which a more equal distribution of heat is effected."

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19. For an improvement in *Whipple-trees*, for disengaging horses from carriages; James S. Shuell, Shiremantown, Cumberland county, Pennsylvania, April 13.

The nature of this improvement consists in connecting the spring bolts, now used for connecting the traces with the whipple-tree, with arms attached to an upright revolving shaft, in the middle of the whipple-tree, by turning which the bolts are drawn back, and the horses liberated. This is effected by a cord attached to an arm on the said shaft, which extends to the driver's seat.

Claim.—"What I claim as my invention, is the combination of the shaft and arms with the spring bolts, constructed and arranged in the manner substantially as herein described, and for the purpose set forth."

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20. For an improvement in the *Cupping Apparatus;* Robert J. Dodd, Philadelphia, Penna., April 13.

The plate with the cupping lancets is screwed to the stem of an air-pump, and the body of the air-pump slides in a stuffing box in the end of a glass cup provided with a bulb at the side, and a cap at the end opposite the stuffing box, formed in the usual manner, to suit the part to be cupped. By this arrangement it will be seen that the lancets are operated by sliding the body of the air-pump, which slides

in the stuffing box, and then the air exhausted to draw the blood by working the piston of the air-pump.

For operating on parts which cannot be reached by the common cupping instrument, a glass tube, of any form required to reach the part, is screwed on to the end of the cup, and a flexible metal tube, with a small triangular lancet on the end, screwed to the stem of the air-pump. In this way the operator can scarify the part, and exhaust without changing instruments.

Claim.—"What I claim as new and original, is the above described method of combining an exhausting syringe with a cupping apparatus, such as is represented, or any other substantially the same in principle, by means of the cup and stuffing box described. I also claim, in combination with the above, the manner in which I operate the lancets for the various purposes above specified, the whole being constructed and operating in the manner set forth."

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21. For an improvement in the *Plough for ditching;* James Herbert, La Grange county, Indiana, April 13.

The share of the plough is made of sufficient breadth for the bottom of the intended ditch, and the mould-board of sufficient capacity to carry up the earth, and discharge it on the side of the ditch. Oblique cutters, made in sections, extend up from the share to the beam, for forming the sides of the ditch; and for the purpose of cutting the sward, rots, &c., there are sharp edged wheels, or disks, attached to the beam, or frame, forward of the oblique cutters, and in the same range with them.

Claim.—What I claim as my invention, is the employment of rotating cutter-wheels attached to the forward end of the frame in the machine referred to, for cutting the earth and sward as described, in combination with the said plough and side cutters; and the side cutters consisting of two, or more, parts each, as described, and connected together for the purpose and in the manner described."

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22. For an improvement in the manner of *Forming Rails for Rail-Roads;* James M. Bay, Harrisburg, Penna., April 13.

These rails are formed of quadrangular bars, cast on to small wrought-iron bars, and at the ends they are formed with wings, brackets, or flanches, by which they are bolted to the stringers, as a substitute for chairs; and for the purpose of retaining all the rails in line, at one end the rail projects beyond its wings, or flanches, and is received between the wings, or flanches, of the next section, which, for that purpose, project beyond it.

Claim.—"What I claim as new, is the particular manner of forming the bars at their ends, which is such, that the end of one bar, in its whole size, shall be received between the wings, or brackets, which form the chair, or that part which forms the next contiguous bar, is attached to the string piece, as described; by which improvement on a cast-iron rail, that has a wrought-iron rod inserted in it, I have

rendered such bars, when resting on string pieces, perfectly safe, and am enabled to substitute a cheap for a costly rail."

The rod of wrought-iron within the cast-iron rail is not claimed.

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23. For an improvement in the *Corn Sheller;* William McCall, Talladega, Alabama, April 13.

The patentee calls this the "fistular corn sheller," because it consists of a hollow cylinder with teeth, on the inner periphery, towards one end, if single acting, and at both ends, if double acting. This hollow cylinder is mounted on a frame, and has a pulley, or cog-wheel, on the middle of its length, by which it is rotated. The attendant presents an ear to the action of the teeth, and after the corn has been stripped from one half, it is drawn out, and the other end presented. The corn is discharged through a hole in the cylinder into a box which surrounds it.

Claim.—"What I claim as my invention, is shelling corn with spurs, or teeth, on the end of a fistular cylinder, which admits the cob to pass into the fistular, and as the small end of the cob almost invariably contains rotten corn, which is permitted to pass between the spurs, or teeth, on the fistular cylinder, without touching, it thus remains on the cob, and is separated from the fine corn. I likewise claim the originality of constructing a double sheller, that is, one at each end of the fistular cylinder."

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24. For an improvement in machinery for *Splitting Strips, or Pieces, of Leather, for the use of Harness;* Alpha Richardson, Boston, Massachusetts, April 17.

This machine, like many of those in general use, consists of a feed roller, a gauge roller above it, and a knife, against which the leather to be split is forced by the rollers—the upper roller gauging the required thickness of the leather. We are informed by the patentee, that in the machines which have heretofore been used for the purpose above specified, the cutting edge of the knife has always been made of a wedge shape, that is, with a bevel both on the upper and under side, and the gauge and feed rollers have always been arranged one above the other, with their axis in the same vertical plane, the edge of the knife being directed to the bite of the rollers on their line of contact, when brought close together. In these machines it has been found impossible to adjust the edge of the knife in such a manner as to cut a piece of leather evenly, so as to have the cut of an uniform thickness, and, in fact, the strip of leather runs, or passes, down on the underside of the knife without being operated upon by the same. The reason for this is that the beveled faces of the knife come in contact with the surfaces of the rollers before the edges can be brought sufficiently near to the bite of the same, to prevent the effects aforesaid. This improvement will effectually prevent the bad results above set forth, and consists in forming a knife with its under side only beveled, and in arranging the bilge of the under side of the upper, or gauge, roller directly over the edge of the knife, so as to

guide the strip of leather accurately to the same; while the bilge of the upper side of the lower roller is placed at a little distance from the edge of the knife, so that the said edge may be brought very near to the surface of the said roller, and prevent the leather from passing down without being split."

Such are the views and the device set forth in the patent under consideration.

Claim.—"I claim the arrangement before specified of the gauge and feed rollers of a leather splitting machine, so that the bilge of the lower side, or the axis of the former shall be directly over, or in the same vertical plane with, the edge of the knife, while the axis of the latter is a little distance out of said vertical plane, and its upper bilge is a little above the level of the edge of the knife, for the purposes recited."

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25. For an improvement in *Wrought-Iron Ploughs;* John Thompson, Ripley, Brown county, Ohio, April 17.

The patentee says,—"The nature of my invention consists in turning the sheath (standard) of the plough outward along the front edge of the mould board, where it joins the share, so as to strengthen it at that point, and prepare a solid seat for the share."

Claim.—"What I claim as my invention, is constructing the sheath so as to turn outward along the edge of the mould board, where it joins the share, all the bolts by which the mould board and share are connected, being put through said sheath in the manner and for the purpose specified."

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26. For an improvement in *Locks for safes, vaults, &c.;* Marcus R. Stephenson, and Oliver Edwards, Boston, Mass., April 17.

This is for an improvement in the permutation, or combination, lock, and consists of a stud projecting from a plate which slides in a groove in the bolt, and at right angles to its length; this stud passes through slots in the permutation tumblers, or sliding plates, and hence the bolt cannot be moved unless the stud corresponds with the slots in all the tumblers. There is an extra lever on the key, which acts on the plate of the stud to place it in the proper position, as well as the permutation tumblers. It will be seen that this will render it much more difficult to open the lock than when the stud is permanently attached to the bolt, for then, by applying pressure to the bolt, a skilful pick-lock can ascertain when the opening in each tumbler is in line with the stud; but in this the very application of pressure to the bolt prevents the stud from moving.

Claim.—"Having thus explained our improvement, we shall claim arranging the stud so as to slide freely up and down, (the same being fixed upon a sliding plate adapted to a groove, and combined with the main bolt,) and be operated by the key, as set forth, or by any other means substantially similar, and the same being for the purpose specified."

27. For a composition of *Sealing Wax and Phosphorus;* John Fatman, Philadelphia, Pennsylvania, April 17.

The sealing wax is made into small sticks of about two inches in length, and one-eighth of an inch in diameter, one end of which is coated with any of the known mixtures of which friction matches are made—to avoid the necessity of a candle in using sealing wax.

Claim.—"What I claim as my invention, is the combination of phosphorus with sealing wax, in the manner and for the purpose described, not confining myself to any particular size, shape, or color, of the sticks. I do not claim the manufacture of sealing wax, nor the composition of igniting matter."

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28. For an improved method of indicating and regulating *Changes of Temperature,* called the "*Thermostat;*" Samuel D. Tillman, Seneca Falls, Seneca county, New York, April 17.

"The nature of this invention consists in the construction of a machine which is moved by the expansion and contraction of a metallic ring upon the application of caloric, and by means of an index, indicates the degree of the caloric by which it is effected; also in the several modes of applying it to dampers, so as to regulate the radiation of caloric from any stove, dumb-stove, pipe, or other structure, in which caloric is generated, or contained; also applying it to ventilators and registers, for the regulation of the temperature of a room."

Claim.—"What I claim as new, are the modes herein described of regulating and indicating changes of temperature by means of a metallic ring; also by means of a ring of zinc inclosing a broken ring of iron, or steel; said ring of steel being attached by one of its ends to the zinc ring, and free to move through its length, its free end operating upon an index by means of a rack and pinion, or other similar device. I also claim the combination of the above arrangement, which I denominate a thermostat, with a register plate, or valve, for regulating the heat of a stove, or for similar purposes, such as the ventilation of rooms, &c., as described. I may use for the above purpose, other metals whose expansive properties are well known."

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29. For an improvement in *Locks, for vaults, safes, &c.;* Marcus R. Stephenson, and Oliver Edwards, Boston, Mass., April 17.

For an explanation of the purpose of this improvement, the reader is referred to the notice of No. 26, of the patents granted the same date as this, the two improvements being for different modes of effecting the same end.

The main bolt has an elongated slot which works on a permanent stud projecting from the lock plate, and on the rear side of the bolt there is a bent lever, or plate, which turns on a pin projecting from the bolt, so that the two move together. This bent lever, or plate, has a slot cut in it, to admit of its sliding with the bolt on the stud before mentioned, and one edge of this slot is continued out to form

an arm, with a notch on the end, and to this bent lever, or plate, and at right angles, or nearly so, to the arm just described, the stud, which slides in the permutation, or combination, tumblers, is attached, so that any pressure applied to the bolt, before the key has adjusted the tumblers, for the free passage of this stud, causes it to strike against the tumblers, which throws up the notched arm in front of the permanent stud, and thus the bolt is prevented from moving backwards.

Claim.—"We claim the combination of appendages to the main bolt, lock case, and stud, (or bent lever,) the said appendages being a bent lever, or plate, having an arm extending from it in the manner described, and the fixed stud of the lock case; the usual stud being made to extend from the bent lever, or plate, and the said plate being made movable upon a fulcrum applied to the main bolt, and the whole being otherwise adapted to the sliding plate, and other parts, and operating substantially in the manner and for the purpose specified."

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30. For an improved mode of *Cutting, Fitting, and Rigging Sails to square-rigged vessels;* Warren C. Choate, Washington, District of Columbia, April 17.

The sails are cut in two pieces, the starboard and larboard halves; the inner and upper edges are bent with rings, those of the upper edge to run on an iron rod called a jackyard, attached at each end to the yard arm, and those on the inner edge running on a jackstay which extends from the jackyard down. The sails are unfurled and furled by means of out and in haulers.

Claim.—"What I claim as my invention, is constructing the sails of square rigged vessels in two separate parts, the starboard and larboard halves, being entirely separate from each other. I also claim the combination of the jackyards and rings, and out and in haulers, with the yards of vessels constructed and arranged in the manner and for the purpose set forth. I also claim, in combination with the above, what I denominate a jackstay, for the inner back of the sail to traverse on, as described."

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31. For an *Æolian attachment for Piano Fortes;* Obed M. Coleman, Philadelphia, Penna., April 17.

"The nature of this improvement consists in combining with the piano, as ordinarily constructed, a series of reeds, in such a way as that each key shall act upon a reed, by opening a wind passage thereto, at the same time the hammer strikes the strings; and also in the manner in which said reeds are combined therewith."

Claim.—"What I claim as my invention, and desire to secure by letters patent, is, first, the combination of the metallic reeds with the piano forte, or other stringed instrument, for the purpose herein described; secondly, I claim the method of combining the bellows with the piano forte, by placing the feeder and riser side by side, so as to lay compactly under the bottom of the piano forte, without disfiguring its exterior; thirdly, I claim combining the action of the

piano forte with the pallets of the reeds, by connecting them by means of the strickdowns and regulating wires, constructed and arranged substantially in the manner and for the purpose described."

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32. For an improvement in *Washing Machines;* William Newbrough, Wooster, Wayne county, Ohio, April 17.

This is for a modification of a washing machine patented by James B. Coffin, on the 2d of February, 1844, and noticed at page 232, to which the reader is referred, and consists in forcing the rollers against the clothes attached to the vibrating frame, between the two sets, by means of two cords at each end, which are fastened together at the bottom of the box, or tub, made to embrace the gudgeons of the rollers, which slide in horizontal, instead of inclined, grooves, and then passes around a small roller at right angles to the rubbing rollers, and from thence over the end of an arm extending from the said roller to a weight.

Claim.—"I wish it understood that I do not claim the invention of the combined series of rollers, but what I do claim as my invention, and desire to secure by letters patent, is the employment of a chain, embracing the journals of rollers, as above set forth, in combination with the rollers and weight, constructed and arranged substantially as described, by which the rollers are pressed towards each other."

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33. For an improvement in the apparatus for *Inking the Form in Printing Presses;* Richard M. Hoe, New York City, April 17.

Claim.—"I do hereby declare that I do not claim the forming of a roller hollow, for the purpose of passing steam, or heated air, through it, in order to elevate its temperature, this having been frequently done, and for various purposes; but what I do claim as new, and as constituting a real improvement in the inking apparatus of a printing press, is the combining of a hollow roller, to be heated by steam, or otherwise, with the fountain, or ink trough, of such inking apparatus, by means of which improvement a quality of ink may be used which could not otherwise be employed, and a better kind of work performed than when such roller is allowed to remain at the ordinary temperature of the atmosphere."

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34. For an improvement in the *Cylinder Printing Press;* Richard M. Hoe, New York City, April 17.

"In the cylinder printing press, as ordinarily constructed, there occurs a slur, or slip, when the cylinder arrives at the head and the foot lines of the page in the forms, occasioned by a slight sinking of the cylinder in passing those points, the consequence of which is that the types, or stereotype plates, are subjected to a more rapid wear in those parts than elsewhere. The object of this improvement is the correction of this evil. For this purpose there is placed a bearer of iron, or of steel, on each side of the bed of the press, upon which bearers the cylinder is to roll, and to be sustained during the whole

time the blanket is not bearing on the type. These bearers may be about an inch and a half in width; and they are to be of a thickness equal to the length of the type, or the height of a stereotype. I also make an enlargement on each end of the cylinder around that part of it which is to rest on the bearers. This enlargement may be in width the same with that of the bearers, and the parts composing it are to rise above the general surface of the cylinder, to the thickness of the blanket which is to cover that portion of the cylinder which passes upon the form, by which means the two surfaces will work exactly together, and no slur can take place."

Claim.—"What I claim therein as new, is the employment of adjustable bearers on the sides of the bed, in combination with the enlargement of the cylinder, in the manner and for the purpose set forth; and it is to be understood that I do not intend to limit myself to the mode of adjusting the bearers by forming them of two wedge-like bars, as herein described, as such adjustment may be effected in other ways; but I have mentioned this mode as that which I have deemed the most simple, and the best."

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35. For an improvement in the *Steam Valve for Steam Engines;* Sprague Barber, New York City, April 20.

"The object of this improvement is to control, or regulate, more perfectly, the quantity of steam which is allowed to pass into the cylinder while the engine is passing the centres, and thereby relieve it of much unnecessary friction, and from the unpleasant, injurious, destructive shock, or jar, which is usual, especially on board of steamboats." To accomplish this object there is a ring which projects from the end of the conical portion of the valve, and which passes into the aperture of the valve seat, leaving a space between the inner periphery of the valve seat, and the ring on the valve of about one-sixteenth of an inch, through which the steam passes, until the valve is lifted sufficiently high to withdraw the check ring from the valve seat.

Claim.—"What I claim as my invention, is the check ring used in connection with the steam valve substantially as described."

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36. For an improvement in machinery for *Spinning, or Making, Roving, &c.;* Phineas Stevens, Nashua, New Hampshire, April 20.

On the shoulder of the dead spindle, and between it and the bottom of the bobbin, there is a washer with two arms extending out far enough to be struck and carried around by the arms, or wings, of the flyer.

This improvement is introduced by the patentee as a substitute for, and as being equivalent to, the live spindle for the spinning of fine yarn, and for making roving.

Claim.—"I claim the metallic washer, arranged upon the spindle, and having arms, or other contrivances of like character, for the purpose of causing the same to be revolved by the flyer; the whole being operated substantially in the manner, and for the purpose described."

37. For an improvement in the *Bee-House;* George R. West, Fairfield, Huron county, Ohio, April 20.

The hives are made with a double inclined bottom, and an opening at the junction of the two inclined pieces forming the bottom, for the discharge of filth into a drawer below. In the house the hives are arranged side by side with a space between them for the entrance of the bees, which space is divided into two passages by a partition, so that the bees from different hives cannot encounter each other.

Claim.—"What I claim as my invention, is the arrangement of the hives with the double inclined bottoms, in combination with the filth drawers extending under both hives—said hives being separated before their entrance by division plates. I do not claim the double inclined bottom, nor a filth drawer under the same, but I claim the above combination."

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38. For an improvement in the *Furnaces of Steam Boilers;* Peter Robinson, Waterloo, Seneca county, New York, April 20.

This is for an alleged improvement in the mode of introducing either cold, or heated, atmospheric air into the flues of steam boiler furnaces, with the view to the better combustion of the combustible gases evolved in the furnace. A pipe is situated at the back of the apparatus, and opening into the end of the return flue; it is provided with a register plate to regulate the introduction of the air, which meets the gases as they turn to enter the return flue, and in this way the air and gases are not only commingled, which is important to combustion, but the draught, in the opinion of the patentee, is greatly increased.

Claim.—"What I claim as new, is the introducing of atmospheric air either at its ordinary temperature, or after it has been duly heated, into the end of the flues of such boilers, where gaseous matter enters, through a tube furnished with a register, or other means of regulating the quantity admitted, said tube being situated, arranged, and operating substantially in the manner set forth."

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39. For an improvement in *Churns;* Harmess Bently, Ballston, Saratoga county, New York, April 20.

The barrel of this churn is rotated on a spindle at the bottom, by means of a band which passes around the barrel, and a drum, or pulley, on the shaft of one of a train of cog-wheels actuated by a weight, in the manner of a clock; and the dasher is jointed to one end of a lever, the other end of which is in connection with a crank pin on a fly-wheel.

Claim.—"I wish it to be understood that I do not claim driving the dasher of a churn by weights, as that has been before effected, although in a manner somewhat different from mine, but what I claim as my invention, and desire to secure by letters patent, is the employment of a revolving churn, and reciprocating dasher, in combination with the driving power, as described."

40. For an improved mode of *Calking the seams of ships, cellars,* and for other similar purposes; William Bennet, New York City, April 20.

"The nature of my invention," says the patentee, "consists in filling the seams, between the planks of which the sides and bottoms of ships and cellars are covered, with wooden wedges, so formed of a suitable width, thickness, and taper, as that every alternate wedge being tapered towards the point edgewise, and sidewise, and placed between intermediate wedges having their taper edgewise towards the head, but tapering sidewise, like the former, towards the point, are placed along in the seam at such distances apart, that, when driven, shall wedge each other edgewise, and against the plank sidewise simultaneously, and thus render the seam water-tight.

Claim.—"What I claim as new, is the particular manner in which I combine the two kinds of wedges set forth, with the edges of the two contiguous planks forming a seam, by which the wedges so formed, as described, do wedge themselves water-tight at their edges simultaneously with the filling of the seam water-tight, by wedging at their sides, also between the plank forming the sides and bottoms of ships, cellars, and analogous purposes."

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41. For an improvement in the machine for *cleaning Grain, and separating it from straw, &c., after thrashing;* Charles W. Cathcart, New Durham, Laport county, Indiana, April 25.

The straw, grain, chaff, &c., is to be discharged from a thrashing machine, or otherwise thrown on to an inclined screen, vibrated by means of bell cranks at each end. The straw is drawn up on this inclined screen by means of an endless belt of rakes; and during this operation the grain passes through the screen on to an endless belt of elevators, which carries it up and discharges it into a fan to separate the chaff. The straw is discharged at the top from the screen on to a short inclined shaking frame made of slats, so that any grain that may have been carried up may pass through this slat work, and fall on to an inclined board attached to, and moving with, the shaking frame, by which it is conducted to the fan.

Claim.—"I do not claim the movable screen, or a movable elevator, but what I do claim as my invention, is the combination of the movable screen, revolving rake above, and endless apron elevator below, in the manner substantially as described. I also claim the shaking frame, in combination with the above, constructed and arranged as set forth."

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42. For an improvement in *Suspender Buckles and Fastenings;* Henry Dubosq, Philadelphia, Penna., April 25.

Instead of making the loop, through which the double strap of a suspender passes, a part of the buckle is made separate with a stem having a "clasp, or work piece," which fits in a slotted eye in a stem projecting from the buckle, to give free play. The "clasp, or

hook," is a button with a shank, and the slot, in the projecting piece of the buckle, is enlarged at the top, to admit the head of the hook, or clasp, which, when passed in, and drawn down, holds the two together.

Claim.—"I do not claim the mode described of fastening the buckle and eye, nor do I claim the use of this mode of fastening in clasps, when freedom of motion is not desired; but what I do claim as my invention, is the combination of a suspender buckle furnished with a projecting piece, or eye, with the clasp, or hook piece, and a double strap. I limit myself to the above combination, whereby I get freedom of motion about a pivot, and great facility for fastening and unfastening."

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43. For an improvement in the mode of securing *Tin, and other Plates, in making metal roofs;* Peter Naylor, New York City, April 25.

Claim.—"What I claim as new, and desire to secure by letters patent, is the attaching of plates by passing their edges between the joinings of double cleats, or strips, of wood, forming ridges from the eaves to the top of the roof, and soldering said plates to strips of metal confined down by said cleats, as described."

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44. For an improvement in the *Hay Press;* Charles F. Paine, Winslow, Kennebec county, Maine, April 25.

The bed plate of this press is at top, and the platen, or follower, below, so that it works upwards in pressing. Pressure is given by means of two toggle joint, or progressive, levers, the follower being connected to them by rods that extend up from the bottom of the follower to the upper arms of the levers; and the improvement for which the patent is granted, consists in connecting these rods with the bottom of the platen, or follower, by means of joint links, so that after a bale has been pressed, and the follower secured, and the tension of the levers removed from the rods, they will descend, and in doing so the jointed links which form their connection will remove them from the sides of the bale, and leave it free to be removed from the press.

Claim.—"I claim connecting the feet of the platen rods with the platen, or follower, by means of links, or other contrivances of similar character, the object of the said links being to permit the lower ends of the rods to be moved laterally from the ends of the bale, as set forth."

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45. For an improvement in *Seed Drills, or Planters;* Loea Pratt, Amherst, Hillsborough county, New Hampshire, April 25.

From the bottom of a hopper which contains the seeds, there is a dropping tube, the aperture to which is governed by a sliding plate. This sliding plate is jointed by one end to the frame, and the other is vibrated by a series of cams on the face of the wheel which carries

the machine—a spring being employed to keep the said plate against the face of the cams. On the other face of this wheel there is another set of cams set further apart, and the sliding, or vibrating, plate is so arranged that it can be shifted from one side to the other whenever it is desired to drop the seeds nearer together, or farther apart. The rim of the wheel is triangular and sharp, for the purpose expressed in the following—

Claim.—"I claim the triangular projection, or rim, applied to the periphery of the wheel, for the purpose of opening the furrow, and thereby dispensing with a furrow plough, such as is generally used in drilling machines; also arranging upon the sides of the wheel, opposite to that on which the first series of cams is placed, and in combination therewith, a second series, the cams of which are placed at greater, or less, distance apart from each other than those of the first series, the same being for the purpose of increasing, or diminishing, the vibration of the seed dropper, so as to readily adapt the machine to drill, or to sow, in hills; the whole of the above being arranged and operating substantially as above specified."

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46. For an improvement in the mode of manufacturing *Coarse, or Alum, Salt by Steam;* Isaac Noyes, Kanawha Salines, Kanawha county, Virginia, April 25.

This is for an improvement on that method of making salt in which the salt water is first boiled, and reduced nearly to the point of saturation in large pans, and then drawn off from these pans into other vessels to deposite the salt, these depositing pans being double bottomed, and heated by the vapor arising from the boiling, or saturating, pans.

The patentee says, that "for the purpose of manufacturing coarse, or alum, salt, a uniform heat should be preserved throughout the granulating cistern, which cannot be done by the ordinary application of steam, by the use of metallic pipes."

Claim.—"What I claim as my invention, is the pipe constructed in either of the methods herein described, part wood, and part metal, alternately, and passing through the cistern, either sinuous, or in a straight line from one end of the cistern to the other, one a conductor of heat, and the other a non-conductor; the one passing the heat to the brine, and the other retaining the heat, and passing the steam to the next metallic pipe, and so on to the end of the pipe;—whereby the heat is distributed alike to all parts of the brine, and its temperature preserved to a degree suited to the manufacture of coarse, or alum, salt, and equalized throughout the cistern. Any material which will produce the same result, may be used for the construction of the pipes; and boxes made of plank may be used instead of wooden pipe logs, but they are more liable to leak."

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47. For an improvement in the manner of *governing the feed of a Drill, or Borer, in a machine for drilling, or boring, Metal;* John R. Grout, Birmingham, Michigan, April 25.

On the stem of the drill, which has a screw cut upon it, there is a nut, and in the frame, in which the drill works, there is a plate of metal, called a friction piece, which can be pressed against the periphery of the nut by means of a thumb screw; when the friction piece is removed, and the nut is free to turn, the drill is not fed in, but when it is held tight by the friction piece, and prevented from turning, the feed of the drill, as it is turned, will be in proportion to the thread of the screw; and the greater, or less, pressure on the nut, allowing it to turn more, or less, will increase, or lessen, the feed.

Claim.—"What I claim therein as new, is the employment substantially in the manner, and under the combination herein made known, of a friction nut, and friction piece, so as to operate upon the mandril, or regulating, screw, or shaft, of a drilling, boring, or other machine, requiring a similar kind of feed; and this I claim whether such machine be made in either of the forms represented, or in any other, where the same principle may be applied by equivalent means."

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48. For an improvement in the mode of *Lettering Door Plates;* Edmund Morris, Philadelphia, Penna., April 25.

Each letter is cast, or otherwise made, on a separate block, and these blocks are so adapted to a door plate, or sign, on the door plate, &c., to the letters, that they can slide in, and then be retained in place, so that the same frame can answer for any combination of letters.

Claim.—"What I claim as my invention, is the manner of securing the letters in plates, or signs, so as to construct both of the latter out of movable type, or letters.

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49. For a mode of making *Fire Proof Ceilings for buildings;* Palmer Sumner, New York City, April 25.

The ceiling is rendered fire proof by means of metal laths made of plate, or sheet, metal, with the two edges bent over towards the middle, to form inclined ledges, which incline in opposite directions, to hold the plastering.

Claim.—"What I claim as my invention, is the method of constructing metallic laths either of iron, or any other suitable material; also the constructing of ceilings by running the laths diagonally across the room, so as to be least affected by the expansion, all of which is fully set forth in the specification and drawings."

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50. For an improvement in *Water-Wheels;* Albert Stimpson, Rockingham, Vermont, April 26.

The water is admitted to the wheel, (which is of the construction known under the appellation of the "center vent water-wheel," the water being admitted to it through the outer periphery,) through a series of conductors arranged around it in the manner of Venetian blinds, and capable of adjustment, to regulate the quantity of water to be discharged. Below there is a discharging tail race provided

with a gate, which, when closed, floods the gate, to prevent freezing in cold weather.

Claim.—"What I claim as my invention, is the combination of the movable conductors with a gate in the tail race below the wheel, constructed and arranged in the manner and for the purpose set forth."

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51. For an improvement in the *Saw Cotton Gin;* John H. Sherard, Livingston, Sumpter county, Alabama, April 30.

Claim.—"What I claim as my invention, is connecting the revolving part of the grate with the other running parts of the machine, so as to cause its periphery to move in a contrary direction to the saws, and the addition of the cylindrical slow brush placed between, and in combination with the winged brush, and the saws. And lastly, I claim the grates placed above the bottom of the flues, in combination with the cotton gin for the purposes specified."

The revolving part of the grates is a roller with a groove for, and into which, each saw runs, and placed above the saws. This device was patented by C. A. McPhetridge, on the 24th of April, 1841, and noticed at page 418, vol. iii, third series, of this Journal; and in this patent the claim is limited simply to the reversing of the direction of its motion, with the view of facilitating the separation of the fibres of cotton from the seeds. The cylindrical brush occupies the place of the winged brush generally employed in cotton gins for stripping the cotton from the saws, and moves much slower, and removes the cotton from the teeth without a current of wind, to permit dirt, &c., to fall through the grates below.

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52 For improvements in the machine for separating *Garlic, and other impurities, from Wheat;* Elisha S. Snyder, Flowing Springs, Jefferson county, Virginia, April 30.

Claim.—"What I claim as my invention, is the manner of constructing the rubber, as set forth; that is to say, with a flexible armed band attached by screws to the cylinder, having packing inserted between the band and cylinder for increasing the diameter of the band, in order to compensate for the wear of the teeth, as described. I likewise claim constructing the stationary cylinder with grooves, and the top and bottom with ears, to rise and fall in said grooves, in the manner and for the purpose specified."

The purpose of these improvements is to adjust the surfaces of the case and rubber to each other, which is deemed of importance in the separation of garlic.

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53. For an improvement in *Cooking Stoves;* Peter Mills, Binghampton, Broome county, New York, April 30.

The nature of this improvement consists in placing over the fire chamber a double cylinder, having a flue between the inner and outer portion, and affixing thereto a swivel cover, the inner cylinder serving

the purpose of an oven, or as a recess, into which a boiler can be set, and the outer cylinder forming a space between the two, connected with the flues, and covered at top, for the circulation of heat around the oven so formed.

Claim.—"What I claim is the arrangement of the double cylinder, in combination with the flue spaces and damper, constructed and arranged in the manner and for the purpose specified."

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54. For an improvement in the *Truss for the cure of Hernia;* Epenetus A. Bennett, New York City, April 30.

The patentee says,—"I do not claim making the spring holding the pad, continuous with the main spring; but what I do claim as my invention, is the peculiar manner in which I form the spring arm, (to which the pad is attached,) by giving the main spring an abrupt spiral curve, at a point distant from the extremity of the (main part) spring, equal to the length of the required spring arm, and then continuing the said bent portion of the spring obliquely downwards, at an angle of about forty-five degrees, with a horizontal plane, or any required angle, forming a spring arm to which the pad is attached, producing the effect set forth."

Patents Re-issued in the month of April, 1844.

1. For an improvement in the machine for *Cutting Shingles*, and other thin articles of wood; Jason C. Gillett, Bloomfield, Michigan, April 30.

This is a re-issue of a patent granted on the 20th of December, 1843, which will be noticed in this Journal in its order, in our list of arrears, and, therefore, we will simply give the amended claim of the re-issue.

Claim.—"I do hereby declare that I do not claim the use of a horizontal rotary wheel, or cutting knives, when taken alone; but what I do claim as my invention, is the manner in which I have arranged and combined the hoppers, or boxes, to receive the stuff to be cut, with the hammer levers, with the horizontal table, and with the knives attached thereto; said knives being so arranged, in the manner represented, as that one shingle, or other article, shall be cut by one knife before the other begins to operate; in the case of a shingle, the butt being cut by one knife towards the shaft, and by the other towards the periphery of the wheel."

Patents for Designs which issued in the month of April, 1844, *under the third section of the Act of August* 29, 1842.

1. For a pattern, or combination of figures, to be worked into *Ingrain Carpeting;* Henry G. Thompson, New York City, April 4.

MECHANICS, PHYSICS, AND CHEMISTRY.

Application of Electricity to the improvement of the Manufacture of Iron.

"The attention of the iron masters has been attracted to a process of considerable importance, lately introduced into their manufacture. The application of electricity, to supersede several of the expensive processes, has, it is stated, been tried in the Welsh and Derbyshire furnaces with satisfactory results. It appears that the costly fuel and labor required for the purification of the ore from sulphur, phosphorus, and such subtle elements, create its high market value; and these being all electro-negative, have induced the new process, whereby the impure stream of metal, after flowing from the blast, is in its moment of consolidation subjected to a powerful voltaic battery, which so disengages the impure components, that in the process of puddling they are readily extracted. The London blacksmiths, it is stated, have tested this iron after a single reheating, and pronounce it equal to the best metal in the market. By the same process an experiment was tried by Dr. Ure, by whom a soft rod of iron was held in contact with a moderate red heat, and that gentleman is understood to have stated that in a few hours the metal was converted into steel. Should these facts prove what they seem, they are calculated to affect most seriously this important branch of our trade."—*Times.*

The process referred to in the above extract, is that for which Mr. Arthur Wall obtained a patent, Nov. 18, 1843. It is thus described in his specification, enrolled May 18, 1844:—

"In casting a bar, or similar mass, the electric current is caused to traverse from end to end, by conductors so arranged, that when the metal runs into the mould it may complete the electric circuit, or by means of a wire, or wires, passed from one end of the mould to the other. If the castings are horizontal, a piece of wrought-iron, or other conducting material, is placed at each end of the mould, which is made of sand, or other non-conducting substance; these conductors are then connected by wires with a galvanic apparatus, or voltaic pile, or electro-magnetic, or other battery; so that, when the melted iron is run into the mould, it will complete the electric circuit; and the patentee prefers to continue the electric current for some time after the iron has solidified. When the castings are vertical, a similar arrangement is made for the passage of the electric current through the metal, by placing a conductor at the top and bottom of the mould, in such a manner, that the electric circuit will be completed the moment the mould is filled with the liquid iron.

"To apply electricity to iron in a smelting furnace, or cupola, a wrought-iron rod is introduced through, or at the side of the tap-hole, until it comes in contact with the melting metal, and another wrought-iron rod is introduced at the upper and posterior part of the hearth, or through one of the tuyere holes, until it reaches the metal; the outer ends of these rods being then connected with a battery, the

electric current will be caused to pass through the iron; care being taken not to continue it so long as to entirely decarburate the iron, and bring it to a malleable state. When the electricity is to be applied to the iron in a puddling, or balling, furnace, two iron rods are also used; one of which is inserted into the fused metal, and the other end is connected with a battery; the other rod is attached to an insulating handle of porcelain, pottery, or other non-conducting substance, and a wire from the battery is connected to it, close to the handle. By means of the handle, the extremity of the rod is caused to traverse the iron in its melted state, or during its transition to the solid state, and the electric current will, therefore, pass through the metal in every possible direction."

Lond. Mechanics' Mag.

Coal Mines of France.

A geological survey of France has been in progress for nearly twenty years, under the care of two very able men, (Messrs. De Beaumont and Dufresnoy,) and was completed three or four years ago. These able and experienced observers examined the whole surface of the country, and the large geological map, which is the fruit of their labors, is now in the hands of the public. Their *Explication de la Carte Geologique*, will contain a complete account of the geology of the country; and the first volume, which was published in 1841, describes every portion of the *terrain houllier*, or coal formation, in great detail. Minute patches of that formation may have been overlooked, but we may be certain that no coal field worthy of notice for extent, can have escaped them. Whoever, therefore, desires full and authentic information respecting the coal mines of France, will find it in that volume, which is accompanied with a reduced geographical map of the kingdom, twenty-one inches square, beautifully and carefully colored. A simple inspection of that map, and a similar map of England, will satisfy any one of the comparatively small extent of coal in France. This is more distinctly set forth, however, in the seventh chapter of the volume, from which we borrow the following details:—

The coal fields of Scotland and England are estimated to occupy a twentieth part of the surface. The coal fields of France occupy only a two-hundredth part of the surface *(seulement un deux centième.)*

The country in Europe best supplied with coal, next to Britain, is Belgium, whose coal fields occupy a twenty-fourth part of the surface.

In France, coal of some description is widely diffused, being found in thirty-three out of the eighty-six departments; but most of the deposits are of trifling extent, and in many of them the coal is poor, or bad, in quality.

The coal basins of France have an extent of 692,000 English acres.
" " Britain, " " 4,900,000 " "

All the coal mines of France produced only 29,447,000 metrical

quintals of coal, or 2,950,000 tons, in 1839—which is about a sixth, or seventh, part of the out-put of those of Britain. Of this quantity, 11,842,000 metrical quintals, or more than one-third, was furnished by the mines of St. Etienne, situated thirty-five miles south-west from Lyons. These mines are described as "the most important in the kingdom, from their extent, their position, and the excellent quality of the coal." They extend over 68,000 acres, and communicate with Lyons and the Rhone by railway; yet, when we visited this part of France, in 1839, we found that the steamers plying between Lyons and Avignon used English coal,—which, we are told, cost 50*s.* per ton. The coal of St. Etienne must be worked under unfavorable circumstances, when English coal competes with it at such a price.

The French coal mines, when compared with those of England, lie under other disadvantages besides those already mentioned. Their situation is generally inland; and, of course, they are deficient in the means of cheap conveyance, which the sea affords. They are rarely accompanied with the iron ore, which, in England, so much increases their value for manufacturing purposes, and as rarely with the limestone, which serves as a flux to melt it.

Lond. Min. Journ.

Jeffery's Marine Glue as a preventive of fouling of Ships.

A naval correspondent of the "*Times*," at Sheerness, states that the Speedwell tender to the Blazer, whose copper had been covered with Jeffery's marine glue mixed with corrosive sublimate, as a means of preserving her copper, and at the same time preventing fouling at sea, has been brought into dock, and the composition all stripped off, having been found a failure.

This was what every one competent to form an opinion must have foreseen. Jeffery's glue is *perfectly insoluble* in water; it is this property chiefly that constitutes its real value, as an uniting material; but the result of mixing any poisonous matter whatever with a perfectly insoluble resinous cement, is merely to envelope the poison in a water-tight covering, so that it is at once put out of the reach of affecting either animal, or plant; in fact, a piece of Jeffery's glue, mixed with corrosive sublimate, might be *chewed* in the mouth, or even so far as the poison was concerned, *swallowed* with perfect safety. To form a poisonous coating which shall prevent the fouling of a ship's sheathing, and, at the same time, prevent corrosion of the metal, whether copper, or iron, its composition, while fatty, or resinous, must be such, that it shall be slightly soluble in water, and so gradually liberate the poison to act on adherent animals, or plants. This is effectually done by Mr. Mallet's patent preparations, of which we gave an account in our 962nd Number, but can never be effected by admixture of poison with Jeffery's glue. Moreover, the poison to which Jeffery limits himself—corrosive sublimate—happens to be one of *the least* destructive of all inorganic poisons to the lower tribes of animals and plants.

Lond. Mechanics' Mag.

Artesian Well at Southampton.

In 1837, the important subject of the supply of water was brought more particularly under the attention of the inhabitants of this town, and at the desire of some of the more spirited and scientific residents, an experimental boring was made upon the common, at a distance of about two miles from the town, and at an elevated spot north of its site. This experiment indubitably proved that an unfailing supply of water could be procured in such unlimited quantity, as, it was hoped would enable it to be supplied to the inhabitants at a reasonable cost. In consequence, measures were immediately taken to sink a shaft. The works have now been in progress some years, and, as will be seen, the artesian well of Southampton is, though uncompleted, a work of the greatest magnitude, vying with, if it does not surpass, the great well of Grenelle, by which Paris has lately been supplied. The depth of the Southampton well is at present 1300 feet. The shaft descends through 78 feet of alluvium, 300 feet of clay similar to the London clay, which is a general substratum in the Southampton basin, and through another 100 feet of plastic clay, before it reaches the chalk, through which it descends 100 feet still further. Thus from the surface a well has absolutely been built downwards nearly 570 feet, and under such difficulties from irregularities in the strata, that four iron cylinders have been placed in points where no attempt at masonry could have proved successful. Not the least singular part of this work is the manner in which this underground well has been built from the summit level downwards, "into the very bowels of the land." This is a matter, however, which it would be tedious to describe; suffice it, therefore, to say, that after reaching nearly 600 feet, the operations of the masons were suspended, and the boring rods were brought into operation, and employed until, through their instrumentality, the contractors have reached a depth of 1300 feet. As might be expected, the supply of water is already abundant. It now rises to within 40 feet of the surface, and by the aid of powerful steam engines no less than 55,000 gallons a day are literally poured into the town of Southampton.

London Times.

New Patent Law in France.

The new French law relating to patents, has received the royal assent, and is officially promulgated in the *Moniteur*. By this law it is declared that new productions in manufactures, and the invention of new means in the application of known means for producing any result in any branch of industry, shall be considered as inventions, with the exception of financial plans, and pharmaceutical compounds. The patents are to endure for five, ten, or fifteen, years, and are to be taxed at the rate of 100f. per annum, for the period of duration. The consequence of neglecting to make one of these annual payments is the forfeiture of the patent. By the penal clauses which define the

rights of the patentee, it is enacted that all who infringe upon those rights shall pay a fine of from 100f. to 2000f.; and in case of a second offence, imprisonment for a term of from one to six months will be added to the fine. Foreigners are allowed to participate in the benefits of the law, and the author of an invention already patented abroad may obtain a patent in France, though it is specially enacted that the duration of this patent cannot exceed that of the patent previously taken out abroad. The law will come into operation in about three months, from which period all other laws relative to patents will be considered as repealed.

Lond. Min. Journ.

Death of Dr. Dalton.

We regret to learn the sudden death of that celebrated chemist and philosopher, the venerable Dr. Dalton, of Manchester, whose decease took place rather unexpectedly, but apparently without pain, at an early hour on Saturday morning last, in the 78th year of his age. His death is presumed to have been occasioned by paralysis, of which he had suffered three attacks since April, 1837. In him science has lost one of the greatest philosophers of his age, and humanity one of its brightest living examples. Dr. Dalton had been for more than half a century an active and invaluable member of the Literary and Philosophical Society of Manchester, having, together with his friend Dr. Edward Holme, M.D., F.L.S., been elected on the 25th of April, 1794. Indeed they were the oldest surviving members of the society, with the sole exception of Sir George Phillips, Bart., who became a member in 1785. Dr. Dalton had been president of this society since 1817. He was born at Eaglesfield, near Cockermouth, in Cumberland, on the 5th of September, 1766, of respectable parents, and gave early indications of mathematical ability. In 1781, he became a mathematical teacher in Kendal, from whence he contributed largely upon mathematical, philosophical, and general subjects, to the "Gentleman's," and "Lady's Diary." In 1788, he commenced his meteorological observations, which he continued throughout his life. In 1793, he was appointed Professor of Mathematics and Natural Philosophy in the New College, Mosley street, Manchester, and continued to hold his office until the college was finally removed to York. He was elected Fellow of the Royal Society in 1821, or 1822, and was also a member of the Royal Society of Edinburg, and of several foreign academies. In 1826, he was presented with a gold medal by the Royal Society, as the individual most eminent for his scientific discoveries. In 1833, a sum of 2000*l.* was raised for the erection of a statue to perpetuate his remembrance, and the task was entrusted to Sir Francis Chantrey, who brought to the execution of his subject a warm admiration of the man, and a proportionate desire to do him justice. The statue, when completed, was deposited in the entrance hall of the Royal Manchester Institution.

Lond. Mech. Mag. Aug. 3.

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